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EPIDEMIOLOGICAL ASPECTS OF RUBELLA.[1]

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I PROPOSE to discuss three aspects of rubella: firstly, the effect that maternal rubella has on the fœtus; secondly, experimental work carried out with rubella on human volunteers; and thirdly, the possibility of active immunization against rubella.

Effect of Rubella on the Fœtus.

In 1941 Dr. N. M. Gregg of Sydney published his findings, which indicted maternal rubella as a cause of fœtal malformation. His thesis has been confirmed in Australia by Swan and others, in the United States of America, in England and on the Continent of Europe. Most of the research that has been devoted to this disease since 1941 has been spent on surveys of groups of congenitally deformed children.

The conclusion has been definite, that maternal rubella has accounted for the majority of the severe congenital defects which have been studied.

The defects produced have been varied. The most serious have been congenital cataracts, congenital cardiac defects, deaf mutism and partial deafness, microcephaly and mental retardation. Natural abortion or stillbirth may follow maternal rubella. A host of minor defects of the baby have also been ascribed to maternal rubella (hernia, difficult feeding and so on); but because these also occur frequently in the absence of maternal infection, it is difficult to assess the role rubella plays in the production of such minor defects.

The severity of the mother's illness does not appear to be related in any way to the severity or type of fœtal defect produced. However, the period of pregnancy in which rubella occurs is of predominant importance; fœtal abnormalities and stillbirth are produced much more frequently when the disease occurs in the first three or four months of pregnancy than when it occurs later. This finding would seem to be explainable by the fact that the affected organs are being laid down in the first trimester. I believe this explanation was first suggested by Professor Ida Mann.

But we do not know how the maternal infection produces the fœtal abnormalities. A frequent suggestion is that the defect is due to an infection of the cells which are in the process of giving rise to the organ, be it ear or eye or heart.

Having decided that the majority of severe congenital defects are due to overt maternal rubella, we may then ask how often maternal rubella in the first trimester is followed by severe fœtal damage. We have not very extensive figures to answer this question.

If we restrict our attention to pregnancies in which the mother suffered from rubella in the first trimester, we find that Fox and Bortin described two defective fœtuses in the nine exposed to risk, Aycock and Ingalls one in two, Swan *et alii* eight in 11, and Ober *et alii* 11 in 22. That is a total of 22 defective fœtuses from 44 pregnancies. Comparable figures for the second trimester are three out of 22, and for the third trimester two out of 14.

[1] Part of a symposium on rubella, read at a meeting of the Victorian Branch of the British Medical Association on July 5, 1950, at Melbourne.

The abnormalities in this series for the first trimester were as follows. Heart lesions were present in 10 cases, cataract was present in six cases, abortion followed maternal infection in four cases, stillbirth followed maternal infection in three cases, microcephaly was present in three cases, deafness was present in one case, mental retardation was present in one case, hypospadias was present in one case, and hydrocephalus was present in one case.

This series of 44 cases is small, but it should not be difficult to enlarge it, since there are many women and a number of medical practitioners who do not consider that maternal infection with rubella is an indication to terminate pregnancy. Unless the point of view of these people is radically changed, I believe material will be available to extend this field of knowledge.

I should like to emphasize that two approaches to this problem have been discussed. Firstly, the study of groups of severely defective children has made possible the statement that the defects in the majority of such children are due to maternal rubella. The second approach seeks to assess the likelihood that a woman will bear a deformed child if she has contracted rubella in the first trimester of pregnancy. Perhaps this likelihood is somewhat less than 50%. We can determine this figure accurately only by watching a sufficiently large number of pregnant women who have contracted rubella and who have elected to proceed to term. This is one of the major rubella research problems confronting us today.

Experimental Work with Human Volunteers.

We have not been able to grow rubella virus in the laboratory and this failure makes it impossible for us to measure rubella antibody; that is, we cannot assess the immune status of a patient. This is particularly unfortunate, because a "negative" history of rubella is often of little value in deciding whether a patient is susceptible or immune.

The failure to grow rubella virus in the laboratory means also that experimental investigation of this disease in Australia must be confined to work with human volunteers. This was recognized by the National Health and Medical Research Council, which recommended the investigation of two main practical problems. The first was to find a means of immunizing girls before marriage. The second was to find a means of preventing infection in vulnerable pregnant women exposed to rubella. The latter problem, involving passive immunization, will be discused by Dr. McLorinan.

In an attempt to solve the first problem, which is the active immunization of girls before marriage, we undertook experiments at Fairfield Hospital; the subjects were women university students. We are grateful to the volunteers, and to the officers at Fairfield Hospital for their help in this study.

The virus was used in the form of throat washings taken from rubella patients on the first day of the rash. This material, sprayed into the respiratory tract of susceptible girls, will produce rubella.

Several conclusions have been drawn from the results of this work. Firstly, they support the belief that the agent causing rubella is a virus, and that it is present in the throat on the first day of the rash. This virus can be stored at -70° C., and in this condition will remain infective for at least two years. The incubation period of the experimental disease, measured from the spraying to the appearance of the rash, ranged from thirteen to twenty days. The experimental disease was infective for susceptible contacts. There was evidence that rubella could produce a subclinical infection. Nine subjects with a history of rubella six to nine years previously were not susceptible to the disease, a finding which strongly indicated that one attack of rubella conferred a prolonged immunity to the disease. It was finally concluded that, in all likelihood, immunity to rubella would follow experimental infection and would persist even longer than the nine years covered by the experimental results.

Active Immunization against Rubella.

That being so, and as we can store the virus, we can reconsider the question of active immunization against rubella. By this I mean the offering of rubella infection to all apparently susceptible girls at about eighteen years of age. This can be done with some assurance that those who are experimentally infected will acquire a prolonged immunity to rubella. But there are two obvious difficulties. The first is that although we can readily prepare rubella virus free from bacterial pathogens, it is not so easy to be sure that it is free of other viruses. The second difficulty is administrative. For example, it would be desirable that those who had been purposely infected should be isolated from the community during a period of ten days. Both of these difficulties may well be overcome; and it may be considered advisable to offer active immunization to all young women who are believed to be susceptible to rubella.

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DIAGNOSIS AND PROPHYLAXIS OF RUBELLA.[1]

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THE older clinicians are often prone to criticize the younger generation for their dependence on laboratory aids to diagnosis. In the case of rubella, however, the mildness of the constitutional upset, the vague, fleeting nature of the rash, the degree of variation in the catarrhal symptoms, and the inconsistency of the lymph glandular enlargement, often make the clinical diagnosis difficult. I, for one, would welcome some laboratory diagnostic aid, realizing that the decision may sometimes be fraught with tremendous consequences. However, until such aid is forthcoming from research workers such as Dr. Anderson and his colleagues, we must depend entirely on clinical observations and experience.

Symptomatology.

I have nothing new to add to what has already been written in text-books on the symptomatology. However, I will try to analyse the relative value of the well known signs and symptoms of this disease.

Catarrhal Symptoms.

The catarrhal symptoms of rubella are mild, transient or absent, thus differing from those of measles, in which the cough, coryza and conjunctivitis are always definite. Many rubella patients will deny any respiratory symptoms; but in my experience at least a slight irritation or itching of the eyelids and a feeling of dryness in the pharynx are always present.

[1] Part of a symposium on rubella, read at a meeting of the Victorian Branch of the British Medical Association on July 5, 1950, at Melbourne.

Lymphadenopathy.

The characteristic adenitis of the mastoid and occipital glands can often be detected for two days before the appearance of the rash. I have seen cases in which they have appeared four days before the rash. From my own experience I would estimate that these glands are enlarged and tender in 75% of cases. Of particular importance is a palpable and tender mastoid gland. In some cases these glands are enlarged but not tender, and are then of less help in diagnosis. In my experience enlargement of the anterior cervical lymph glands is of no positive help in the diagnosis.

The Rash.

The rash of rubella may be described unscientifically as being half-way between that of measles and that of scarlet fever, but with a distinct leaning towards the characteristics of the measles family. The individual lesions are smaller than measles and rather lighter in colour and they fade more quickly. There is never any staining of the skin so characteristic of a fading measles rash. In a similar manner to measles, the rubella rash reaches its height first on the face and neck, but may be visible there for only a short period. The rash on the body, although papular and morbilliform in the early stages, may become scarlatiniform as it begins to fade, and in the later stages it is often difficult to distinguish it from the rash of mild scarlet fever. To make matters more difficult, a small percentage of rubella patients may have mild tonsillitis, in which case the diagnosis will depend on the presence or absence of group A hæmolytic streptococci or other positive signs of scarlet fever, such as a characteristic peeled tongue. Koplik spots are never present in rubella, and gross congestion of the mucous membrane of the palate and fauces, as is seen in measles and scarlet fever, is absent in rubella. The blood undergoes no characteristic changes, although some authorities, including Dr. Anderson, have noted an increase in Turck cells.

Comment.

To sum up, I would say that the important positive points in the diagnosis of rubella are as follows: (i) enlarged palpable and tender posterior cervical glands, particularly the mastoid gland; (ii) mild catarrhal symptoms for a period of two days, consisting of dryness of the pharynx and slight irritation of the eyes; (iii) a rash which is finely morbilliform in character, the individual lesions being smaller and a lighter pink colour than those of measles, but larger and not so closely packed together as those of scarlet fever.

From time to time outbreaks of rubella have been reported in which the symptoms are comparatively severe. I wonder in how many of these cases the diagnosis may have been infective mononucleosis with a morbilliform rash. The differential diagnosis, apart from measles and scarlet fever, includes a host of conditions which cause a rash.

Prophylaxis of Rubella.

I shall pass over all the obvious precautions which should be taken to protect pregnant women—for example, the avoidance of contacts, *et cetera*. Dr. Anderson has already given a lucid account of the possibilities of prevention by producing active immunity. It is now my duty to give the results of temporary passive immunization by the use of the γ globulin fraction of convalescent rubella serum. It is reasonable to infer that even a mild attack of rubella in the mother may have undesirable effects on the fœtus, and therefore it is necessary, when a pregnant woman comes in contact with a person suffering from rubella, to give her a sufficient amount of the immunizing agent, as early as possible after contact, to prevent the disease completely. The problem, therefore, is rather more difficult than in the serum prophylaxis of ordinary measles, in which it is often desirable to obtain a mild or modified attack of the disease.

The passively immunizing agent we have used in Victoria for the last two and a half years has been the γ globulin fraction of convalescent serum. The production of this material has been the work of the following institutions: the Walter and Eliza Hall Institute of Medical Research, the Commonwealth Serum Laboratories and staff under Dr. F. G. Morgan, the medical staff of Flinders Naval Base under Surgeon-Captain L. Lockwood, and lastly, and most important of all, the Red Cross Blood Transfusion Service under Dr. Lucy Bryce, who collected blood from the volunteer convalescents. Fairfield Hospital has acted as distributor of the serum. Most of the blood has been obtained from the personnel of the Flinders Naval Base, where an epidemic occurred in September, 1947, and later another batch was collected from the Balcombe army apprentices' camp.

Although many offers have been received from individual rubella patients to give their blood, Dr. Bryce has preferred, up to the present, to collect blood from outbreak camps and institutions such as the two I have mentioned. There can be no doubt of the diagnosis in such outbreaks, and the resultant serum has a high titre of antibody content.

Medical practitioners in Victoria have readily availed themselves of the opportunity to use the serum for the protection of their maternity patients who have been unfortunate enough to come into contact with rubella in the first four months of pregnancy. We have refused requests for γ globulin for use in pregnancy after the fourth month, but we have advised in many cases the use of adult pooled serum, partly as a *placebo*, but partly in the belief that it may have a beneficial effect. In the last two and a half years we have issued 670 doses of γ globulin, but we have been able to follow up so far only 520 patients. In seven out of these 520 there has been a failure to give protection—that is, symptoms of rubella have developed after the proper incubation period in seven cases.

The dosage used was originally two millilitres, but after there had been five failures we increased the dose to four millilitres. Even then there have been two more failures.

The result must be described as very satisfactory, but we must make full allowance for three factors in assessing the full protective value of the serum: (i) the number of subjects who were already immune to rubella; (ii) the number who were not really contacts of rubella, owing to a mistake in the diagnosis of the contact; (iii) the number of cases in which the contact was not intense or prolonged enough to have produced rubella in any case.

I agree that before making any claim for the efficiency of this protective agent we should have a controlled experiment in a closed institution or a camp. But I believe that the figures indicate that we can be pardonably optimistic and advise that if the specific γ globulin is given reasonably early—that is, not later than the eighth day after contact—there is a good chance of preventing rubella.

In the seven cases in which rubella developed in the first four months of pregnancy, I have to report the following follow-up results: in three pregnancy was terminated, in one there was a miscarriage, and in three pregnancy continued to full term. Two of these children, one aged one year, one aged five weeks, appear to be normal babies. The third is only two weeks old and is at present in the Children's Hospital suffering from bronchopneumonia. A resident medical officer has informed me that the child appears to be normal otherwise.

Much more work remains to be done in following up the results of the remaining pregnancies. It is possible that some patients may have suffered from a subclinical attack of rubella. We have no information to assess the effect of such a mild attack of rubella on the fœtus. With the help of the Victorian Health Department a survey of these cases is now under way. The work will probably take several years to complete.

To sum up the results of passive immunization, I believe that if a woman in the first four months of pregnancy should come into contact with a suspected rubella patient, she should in the absence of a recent previous history of rubella be given four millilitres of rubella γ globulin. We

must hope that, by taking the opportunity arising from further outbreaks of rubella in suitable institutions, and with the continued good offices of the Red Cross Blood Transfusion Services and the Commonwealth Serum Laboratories, there will be forthcoming further supplies of γ globulin until a more efficient method of preventing rubella is discovered.

Conclusion.

I have only one further suggestion to make in connexion with the campaign in the prevention of developmental defects caused by rubella, and that is that we might copy the example of Queensland and make rubella a notifiable disease in females aged over fourteen years.

RUBELLA IN PREGNANCY: THE OBSTETRICIAN'S PROBLEM.[1]

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A FEW years ago it would have seemed incredible that an obstetrician should be taking part in a discussion on rubella, and it is a pleasant reflection to realize that this revolutionary state of affairs has been brought about by the clinical acumen of an Australian ophthalmologist—namely, Gregg—who published his initial observations on the effects on the fœtus of rubella in early pregnancy in 1941.

Confirmation of Gregg's observations on the relationship of rubella to the incidence of congenital cataract, and further observations on its relationship to other fœtal abnormalities such as deafness and cardiac abnormalities, were made by the painstaking surveys of Swan, Tostevin and others in Australia, and these observations have since been substantiated in other parts of the world.

The Nature of the Congenital Malformations.

The initial observations by Gregg were mainly on the relationship of congenital cataract to maternal rubella; but in more than half of his reported cases a congenital cardiac lesion was noted.

Later work by Carruthers and by a New South Wales committee established the even higher incidence of deafness varying from minor degrees to deaf-mutism. Other eye defects such as retinitis and microphthalmos were subsequently described, and Swan in a most comprehensive survey produced an amazing list of abnormalities, including inguinal hernia, hypospadias, hydrocele and various dental malformations which occurred in children born of women who had suffered from rubella. Cases of mental defect and mongolism have also been recorded, and in addition to these malformations, there is a high incidence of abortion and stillbirth.

Incidence of Congenital Malformations.

The incidence of congenital malformations has been dealt with by Dr. Anderson; but I wish to draw attention to the fact that there is a wide divergence of opinion as to the frequency of these malformations. Initially it was held that almost 100% of mothers who contracted rubella in the first three months of pregnancy gave birth to children showing some defect; but the basis for such a conclusion was not sound, as there was no satisfactory means of finding out the number of mothers who contracted rubella during this period of pregnancy and who had normal children. The reason for this is that rubella is not a notifiable disease.

Patrick attempted to obtain figures in Queensland by means of a *questionnaire*, but the accuracy of these figures was doubtful for various reasons.

Swan gave the incidence of congenital defects as 74·4% if rubella was contracted in the first four months of pregnancy; but in this he included all forms of defect, many of which are insignificant, and many of which are easily remediable by surgical measures.

The Severity of the Defects.

From the obstetrician's viewpoint, the crux of the situation is the incidence of irremediable defects, as there have been numerous suggestions that termination of pregnancy should be performed if the mother contracts rubella in the first four months of pregnancy.

In view of this, the obstetric staff of the Women's Hospital, Melbourne, held a symposium last year on the subject of rubella in pregnancy, and it appeared from the opinions then expressed that certain of the congenital malformations were very difficult to treat. Congenital cataract and microphthalmos were most unsatisfactory, as also were many of the cardiac lesions. In the more severe grades of deafness also there was little prospect of improvement, but it was suggested that many of the children with hearing defects were able to be educated and made into useful members of the community. Similarly it was found that many children classified as mentally defective had been found later to be only mentally retarded, and on still later examination appeared to have caught up and become more or less normal.

At this meeting it became apparent, from the statements of epidemiologists, that the best that could be done in assessing the incidence of congenital defects following rubella in pregnancy was the making of a well-informed guess. The impression was that in the first three months the over-all risk to the fœtus, including fœtal death and all types of congenital anomaly, was between 25% and 50%. The risk of the birth of a viable, grossly handicapped child would be about half that figure—that is, there is a 1:4 to 1:10 probability that any viable child resulting will be so damaged as to be a liability rather than an asset to the community.

The most vulnerable period of pregnancy is from the twelfth to the hundredth day after the first day of the last menstrual period, although the susceptibility of the ear to damage may extend to the end of the fourth month. Later than this the risk is insignificant.

The epidemiologists concluded that termination of pregnancy should be advised for any woman who developed rubella between the twelfth and the hundredth day after the first day of the preceding menstrual period. Should rubella occur later than this, termination should not be considered.

This raises the question of the legal position in regard to termination of pregnancy in such a case, and I propose to discuss termination of pregnancy under the following headings: (i) the legal position; (ii) the position of the obstetrician; (iii) the position of the psychiatrist; (iv) the position of the obstetric teaching hospital; (v) the position of the medical practitioner who first examines the patient.

The Legal Position.

In theory, the legal position is perfectly clear, but the issue has been recently clouded by the famous case of Rex *versus* Bourne in July, 1938. Dr. Alick W. Bourne openly performed a termination of pregnancy on a girl, aged fourteen years, who was pregnant as the result of a criminal assault, and was then charged with having performed the operation. Dr. Bourne was acquitted.

In his charge to the jury the judge said:

> If pregnancy were likely to make the woman a physical and mental wreck, the jury was entitled to take the view that the operation was justified. If the doctor, in good faith, thought the operation was necessary, he was not only entitled to operate, but it was his duty to do so. The jury must decide whether the doctor had acted in good faith.

[1] Part of a symposium on rubella, read at a meeting of the Victorian Branch of the British Medical Association on July 5, 1950, at Melbourne.

Termination of pregnancy is an operation within the meaning of Section 62 of the *Crimes Act*, and the only justification for termination is that it is performed to prevent injury to the health of the patient. There is no legal justification for termination of pregnancy because the fœtus is abnormal or likely to be so. Any damage to the fœtus in rubella does nothing to increase the maternal hazard during pregnancy or labour, so there is no justification for termination of pregnancy as far as the physical health of the mother is concerned. The only loophole is that continuation of the pregnancy may do harm to the mental health of the mother—that is, make her "a mental wreck". The decision in regard to this is the province of the psychiatrist and will be discussed under the third heading.

The Position of the Obstetrician.

The position of the obstetrician, to my mind, is clear. If termination of pregnancy is performed, it is the obstetrician who performs the act, and it is the obstetrician who is legally responsible for all consequences arising from the performance of the act. Rubella is a general medical disease with epidemiological, pædiatric, ophthalmological and psychological implications, but there is no true obstetric problem. Because of this, it is obvious that the obstetrician should not take upon himself the responsibility of advising termination of pregnancy in such cases, but should obtain the opinion of a psychiatrist as to the possibility of damage to the mental health of the patient.

Even if termination of pregnancy is advised, the obstetrician may refuse to perform the act, as it is the opinion of many that the collusion between the psychiatrist and the obstetrician is equivalent to the compounding of a felony and both may be prosecuted. In such events, the crux of the situation is "whether the doctors acted in good faith", to quote from the case of Rex *versus* Bourne, and this is what a jury must decide.

The Position of the Psychiatrist.

The opinion of the psychiatrist is of the utmost importance, as termination of pregnancy can be performed only on the grounds that the mental health of the patient is likely to be materially affected by continuance of the pregnancy.

In this connexion, it should be apparent at once that if a mentally normal mother had no knowledge of the implication of rubella in pregnancy there would be no problem at all, and termination of pregnancy could not possibly be justified. However, the publicity given to the condition in the lay Press has made this situation unlikely.

There is a great responsibility on the psychiatrist in this condition, and it is apparent that, in the assessment of the effect on the mother's mental state of the possible birth of a malformed child, the most important consideration is the incidence of irremediable defects. Women occasionally give birth to children suffering from mongolism or other grave defects, but because of the low incidence of these conditions, no one would advise termination of pregnancy because he thought that the possibility of bearing such a child would harm the mother mentally. However, if it is proven that in rubella the incidence of irremediable defects is high, and the mother is cognizant of this, the situation is altered, and the psychiatrist must be guided in his assessment by the normal mental health of the mother.

In the symposium previously quoted, it was considered that in the case of a mentally healthy woman, courage and sanity will prevail, and she will finally adjust herself to the burden she may have to carry. In the case of neurotic women, schizophrenics or grossly hysterical women, termination of pregnancy may be advisable. However, there is some difference of opinion among psychiatrists, some tending to be more radical in their views regarding termination of pregnancy in this condition. In such cases the obstetrician may be disposed to creep under the umbrella so invitingly held out by the psychiatrist, and may terminate the pregnancy even of a mentally stable woman.

The Position of the Obstetric Teaching Hospital.

The staff members of a teaching hospital must give most careful consideration to the policy they adopt in regard to termination of pregnancy, because their decision in such a matter is a determining factor in the acceptance of this plan of treatment by all who pass through the school, and also by the medical profession at large. The staff members must therefore adopt a rather conservative attitude, and must be sure of their ground before accepting this method of treatment in the cases under discussion.

The staff of the Women's Hospital, Melbourne, is adopting this conservative attitude, as it is held that valid figures about the frequency of congenital defects are not yet available, and it considers that if an adequate follow-up system is adopted, the hospital may be able to produce such figures, and thus help ultimately to solve the problem.

The Position of the Medical Practitioner who First Examines the Patients.

The medical practitioner, if alert, can often prevent the occurrence of rubella by treating all pregnant contacts of rubella patients with protective antiserum in the manner outlined by Dr. McLorinan, and this is unquestionably the most fruitful method of attacking the problem.

After the contraction of rubella by a patient in the vulnerable period of pregnancy, the practitioner should make every effort to establish the diagnosis beyond any question, even to the extent of having a consultant's opinion, as the diagnosis of rubella is often far from easy. Once the diagnosis has been established, the opinion of a psychiatrist should be obtained, either before the patient is referred to the obstetrician or concurrently.

This sounds straightforward, but difficulties must arise over the somewhat cumbersome procedure. Some patients may be unaware of the implications of rubella in pregnancy, and it has been suggested that such patients are better left uninformed. With this view I entirely disagree. I was long enough in general practice to realize that if the doctor does not tell the patient some one else will, and the patient will then show hostility towards the doctor and will noise his "neglect" abroad.

I am sure that it is better to be quite open about the matter; but it is unnecessary to throw the patient into a panic, in view of the doubts recently raised about the gloomy figures of the incidence of abnormalities quoted in earlier papers on the subject.

Summary and Conclusions.

The outstanding points are as follows.

1. The unscientific method of assessing the incidence of fœtal abnormalities in most surveys. In general, it must be admitted that the incidence of irremediable defects is considerably lower than was at first thought.

2. The need for research on the matter, including notification of all cases of rubella in pregnancy, and careful follow-up of children born in such circumstances.

3. The divergence of opinion among psychiatrists on the effect upon the mother's health of the knowledge that she may bear a defective infant. With this difference of opinion I have every sympathy, as at present we are ill-informed of the true risk of fœtal damage.

At this point I should like to examine the advice of epidemiologists that all expectant mothers contracting rubella in the vulnerable period should have the pregnancy terminated. It is apparent that, as the law is at present, such an act is illegal, and the loophole through which we scramble when termination of pregnancy is performed is that continuation of the pregnancy will damage the mother's mental health. If we are quite honest with ourselves, do we really think that a mother's mental health will be permanently impaired? Or are we allowing ourselves to be swayed by sympathy for the mother in what may be a heavy burden, and one we should not like to carry ourselves in similar circumstances?

Is it advisable that we, as a profession, should repeatedly carry out acts which are illegal, but escape the consequences of our acts by virtue of a loophole in the law?

I maintain that it is not, and if we can produce valid figures of a high incidence of malformations, we can produce a case for having the law altered. In any event, there should be adequate safeguards to prevent the position from being exploited by the unscrupulous. The production of such figures may subject a number of people to a heavy burden, but if ultimate good is to ensue we must be prepared to pay this price.

In the present circumstances, I would strongly advise the general practitioner never to terminate a pregnancy on the grounds of maternal rubella in the vulnerable period of pregnancy. He should concern himself with prophylaxis and with diagnosis of the disease, and I would advise him to have a consultant to confirm this diagnosis whenever feasible.

The obstetrician should not advise termination of pregnancy, but should get the opinion of a psychiatrist, and if he advises termination the opinion of a second obstetrician should be obtained. If all are in agreement, then termination of the pregnancy may be performed, but it should be done openly in a public hospital or in a reputable private hospital.

I point out in conclusion that even in such circumstances the act is illegal, but it is doubtful if the Crown Law Department would prosecute the doctor responsible, or if a jury would convict a doctor even if he was prosecuted.

Such a situation is not a happy one, either for the obstetrician or for the medical profession as a whole. I will admit that I have terminated pregnancy with the above safeguards, but I have always felt uneasy about it as the operation is not free from risk. In the event of a fatality due to the operation, the position of the obstetrician is unenviable, and this situation will surely arise sooner or later. A committal of the obstetrician for manslaughter or even murder by the coroner is then a possibility, and it would be interesting to have the opinion of the members of the council of the Medical Defence Association of Victoria who may be present as to what action the association would take in such a case.

At present, therefore, it appears that the obstetrician who decides to terminate pregnancy on these grounds has a heavy responsibility, and he must safeguard himself in the manner described earlier. Furthermore, the adoption of this procedure is necessary to prevent abuses.

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ALLERGY OF THE NOSE AND THROAT.[1]

By R. S. STEEL,
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I WISH to confine my remarks this evening to hay fever and giant urticaria as it affects the ear, nose and throat specialist and the allergist.

No definition of allergy is complete, but von Pirquet defines the word as "an altered capacity to react to foreign substances". These substances, or allergens, are not necessarily proteins, and even temperature changes may act as allergens in certain circumstances.

Certain criteria have been postulated which will designate a symptom-complex as allergic. The best are those of Rackeman and Colmes: (i) symptoms must be produced on contact with a particular agent foreign to the body; (ii) interruption of contact will cause cessation of symptoms; (iii) specific sensitivity can usually be demonstrated by skin tests.

These symptom-complexes can be explained pathologically as due to spasm of smooth muscle, to increased capillary permeability, or to both factors together.

It would appear that increased capillary permeability is the chief factor pertaining to allergy of the upper part of the respiratory tract. This increased capillary permeability produces localized œdema, which is the essential lesion in allergy and is associated with round-cell and eosinophile-cell infiltration. Further, this increased permeability with consequent œdema is due to the liberation of histamine by the interaction of antigen (allergen) and antibody.

Specific antibodies have been demonstrated in the blood by the method of passive transfer and are largely fixed cellular antibodies, the Type II antibodies of F. M. Burnet.

To say that a reaction is allergic is to imply that the individual who manifests that reaction has had previous contact with the specific substance, and there is a definite tendency for patients to become sensitive to substances with which they come in contact in massive doses.

One of the outstanding characteristics of allergy is its specificity. This means that the same symptoms are produced by a specific allergen, or by a biologically related substance, in the one individual. In practice it does not necessarily mean that symptoms will be produced, however, on every single exposure to the allergen, especially when the exposures are at short intervals, as when allergic foods are taken daily.

Inheritance of allergy is probably due to a true Mendelian dominant (Bray). Manifestations, however, are transmitted twice as frequently through the female. In a survey of allergic diseases a positive family history of allergy was found in 68% of cases, 51% being unilateral and 17% bilateral (Steel). These are intermediate figures compared with those of some American and English workers. The first decade of life is the commonest time of onset of allergic conditions, and a diligent search should be made into the family history of any child (or adult, for that matter) suspected of having an allergic symptom-complex; also, any other allergic symptoms should be sought after in the same individual—for example, infantile eczema, urticaria.

In patients presenting with nasal symptoms, it is essential to inquire as to the time and place of attacks and any possible cause noted. People with hay fever may present themselves complaining of sneezing, nasal blockage, discharge, swelling of the eyelids and itchy eyes, palate and ears, or any combination of these symptoms. Frontal headache may also be a symptom, as the sinus mucosa is the site of allergic œdema (or shock tissue) as well as the nasal mucosa.

A careful examination of the upper part of the respiratory tract is essential. Proof puncture of the antra and X-ray examination of the sinuses may be necessary.

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on May 25, 1950.

Diagnosis.

The following points are of importance in diagnosis.

1. A careful history is essential, and a diagnosis can practically always be made from the history and clinical findings.

2. A positive family history occurs frequently.

3. Skin-test reactions to foreign substances are frequently positive, and any person giving a positive skin reaction to foreign substances should make us suspect that the presenting symptoms may rest on an allergic basis.

4. Eosinophilia is a common finding, both in the blood and in the nasal secretions. This may be difficult to demonstrate in the thin watery nasal discharge and is not a common finding, in my opinion, in infective or bacterial allergy.

5. The first decade of life is the time for the maximum onset of allergic conditions—for example, infantile eczema and urticaria. Recurrent coryza and so-called bronchitis in the child are frequently allergic, but pass unrecognized till they assume the text-book characteristics of hay fever and asthma.

6. Hypotension is frequently found.

Hay fever precedes asthma in about 60% of cases.

Antigens or Allergenic Substances.

Antigens or allergenic substances may be classed as (i) inhalants, such as pollens, dust, moulds, cat dandruff *et cetera*, (ii) ingestants, such as milk, honey, aspirin *et cetera*, (iii) contactants (but these are not common in upper respiratory tract allergy), or (iv) bacterial invaders (bacterins).

Skin tests for hay fever should be carried out by the scratch or intradermal method on any suspected allergic individual. The particular tests should be performed with the usual allergenic substances and any others which the clinical history or environment may suggest as possible causes. Often the patient can indicate a definite cause, such as house dust, but there may be other causal substances as well. The tests should be performed by some person accustomed to the work, as there are many pitfalls in performing and reading the tests, fitting the results into the clinical history, and thus outlining appropriate treatment.

All tests must be carefully controlled, and great care must be taken with intradermal tests for fear of general reactions.

Positive skin-test findings occur in 80% to 90% of cases in hay fever.

Classification of Hay Fever.

Hay fever may be classified as follows:

1. *Seasonal.*—The seasonal type (pollenosis) is due to the air-borne pollens of grasses, weeds and trees, which travel on a light, dry breeze for hundreds of miles. In springtime the plantain, capeweed, rye grass *et cetera*, cause much trouble. The bee-borne pollens cause trouble when certain flowers are placed indoors for decorative purposes, for example Iceland poppies, dahlias, daisies, wattle, all heavy pollen-bearers. The times of pollination must be known to the allergist.

2. *Perennial.*—Perennial hay fever occurs at any time of the year and is due to (i) inhalants, such as house dust, moulds, feathers, cat dandruff, flour, or (ii) foods and drugs. The second group is not so common as some authorities would lead us to believe as causal factors of hay fever, but tea, coffee, beer *et cetera* may act as reflex causes of attacks.

3. *Bacterial.*—Bacterial allergy causes a chronic infection, frequently of low-grade toxicity, in which ordinary skin tests produce no reaction (the bacterin test is a non-specific twenty-four-hour test). Possibly multiple virus infections with secondary recurrent invasion produce the pathological picture. Although purulent nasal discharge is by no means the usual finding, culture shows the presence of streptococci and *Micrococcus catarrhalis*, and the nasal mucosa presents a persistently red colour. This type, that of the bacterin-sensitive person, is quite common, and is frequently associated with the inhalant-sensitive type. Welmer and Cobe consider that bacterial allergy is a definite pathological entity, which responds to bacterin therapy either through desensitization or increased phagocytosis or by stimulation of antibody formation.

Comment.

There is no typical appearance of the nasal mucosa in individuals with positive skin-test reactions to inhalants. For every pale, bluish, soggy mucosa, we see 50 of various shades of colour from pale to dark red and dry or moist, with or without pale plaques. All of these can be allergic.

While the outstanding characteristic of allergy is its specificity, many non-specific causes produce attacks of hay fever at times. Included amongst these are strong smells, steam, temperature changes, tobacco smoke, the smell of burning fat, beer, proprietary washing powders, lime, cement and emotion.

The person who sneezes in the early morning and is worse in cold weather, or when having a haircut, or when sea-bathing, is usually a bacterin-sensitive subject.

In inhalant allergy, the subepithelial tissue of the mucosa is œdematous rather than fibrous, and when the stroma can no longer support the amount of fluid, the tissue prolapses into the formation of polypi. I consider that some degree of infection is probably always present when polypus formation occurs, but Bray says that in these cases the nose is very resistant to infection.

Value of X-Ray Examinations.

X-ray evidence of dulness may quickly disappear, and consequently a period of acute exacerbation should be avoided for X-ray examination.

A diagnosis from the X-ray film should never be made without full clinical knowledge of the case and careful intranasal examination.

Operative measures based on X-ray findings alone should be condemned.

Two patients with a thin, watery discharge from the nose have presented themselves to me. In both cases the discharge yielded a positive reaction to sugar; it was cerebro-spinal fluid. Although rare, this possibility should not be overlooked.

Treatment.

Treatment to be instituted after the taking of a careful history, physical examination and skin testing may be outlined as follows:

1. If possible we remove the cause—kapok or feather pillows, cats *et cetera*.

2. Specific desentization may be carried out, to cover three seasons in the pollen-sensitive patient, and at least twelve months in the other inhalant type of allergy.

3. Vaccines may be administered in the bacterin type; this can be combined with desensitization to inhalants.

4. Local applications may be used as sprays and drops.

5. Antihistamine drugs are of great value, but the toxic effects are sometimes very marked.

6. Hygienic measures are directed to the prevention of heat loss from the body, for example, the wearing of hats, no night baths, and the avoidance of draughts.

7. Light cauterization of the nose may be used. Ionization with 1% zinc sulphate solution has given good results in the bacterial type.

8. Operations should be conservative at all times and should not be performed during the hay fever season, with the exception of removal of polypi which should be carried out as early as possible and as often as necessary.

Giant Urticaria.

In giant urticaria swelling of the lips, tongue, larynx *et cetera* occurs with dramatic rapidity.

Causes.

Causes of giant urticaria include the following: foods —fish, chocolate, milk, eggs, alcohol *et cetera*; drugs, for example aspirin, are a common cause; infection, for example, tonsillitis; infestation, for example, with thread

worms; salt toxicity—most of these people eat a lot of salt. Emotion can precipitate the œdema at any time irrespective of the specific cause.

Treatment.

Immediate treatment is the injection of adrenaline and local application of adrenaline on a swab. The injection of pituitrin and of antihistamines such as "Antistine" is of value, and sedatives such as heroin may be necessary.

Later treatment consists in (i) elimination of the cause when found by skin testing, elimination diets or the leucopenic index, (ii) administration of antihistamine drugs, (iii) calcium therapy, and (iv) treatment by a psychiatrist if necessary.

NASAL ALLERGY.[1]

By BERNARD BLOMFIELD.
Sydney.

SYMPTOMS of nasal irritation, paroxysmal attacks of sneezing followed by rhinorrhœa and nasal obstruction, make easy the diagnosis of typical nasal allergy. However, one is constantly faced with cases in which the history is indefinite and the symptoms are atypical. In children in particular, it is frequently difficult to make up one's mind whether or not one is dealing with a case of primary nasal allergy complicated by a secondary infection or whether the infection is the primary factor; especially is this the case when one is told that the child has had a stuffy dirty nose since birth. The diagnosis rests on a careful history of the case, aided by skin tests, cytological tests and clinical findings. The taking of the history must include an investigation into the occurrence of other possible manifestations of allergy, particularly skin manifestations, such as hives, urticaria and dermatoses, intestinal manifestations, migraine and so on. As there is known to be a very strong hereditary tendency, a careful inquiry must be made into the family history as to the occurrence of asthma, hay fever and other manifestations of allergy in parents and near relatives. One point to bear in mind is that the time of life at which the symptoms first manifested themselves tends to be repeated in the offspring; that is to say, if a person's symptoms did not occur till late in life, the same is likely to occur in such a person's children. Certain occupations, particularly those in a dusty or smoky atmosphere, bakeries and so on, must be investigated as a possible aggravating factor. In the case of food and the effects of weather, the keeping of a diary will sometimes reveal a possible cause of the condition. A survey of the atmospheric contents of pollens and dusts in various districts, and an observation of prevailing winds, may sometimes give an indication of a suspected cause.

The occurrence of frequent head colds must raise suspicion as to the real cause of these attacks. One is frequently told that the symptoms first arose after an operation, especially that for the removal of tonsils and adenoids, and this raises a significant question—whether the symptoms were present before operation and the operation (especially the removal of adenoids) was performed with a view to relieving the nasal obstruction, or whether the operation actually precipitated the onset of the disease in a person, who was already predisposed, by upsetting the adrenaline balance of the patient. The cytological examination of smears made from the nasal secretion reveals a predominance of eosinophile cells, neutrophile cells, or a mixture of both. Eosinophile cells denote an allergic condition, neutrophile cells infection, while the presence of large numbers of both eosinophile and neutrophile cells denotes a condition of nasal allergy complicated by a secondary infection. The presence of neutrophile and pus cells in the absence of eosinophile cells, or with only a few, does not preclude an allergic state, as the infection may be so strong as to overshadow the primary condition. The pathology of allergic conditions depends on local œdema due to increased permeability of the capillary walls brought about by the liberation of histamine. With nasal allergy the mucosa of the nasal cavities and of the paranasal sinuses, being a continuous structure, is affected throughout. In the nasal cavity the parts most affected are the coverings of the turbinate bones and the middle meatus. In the latter position the mucous membrane may swell to an enormous degree, giving rise to the formation of nasal polypi, which may eventually fill the entire intranasal space, and by expansion may spread out and enlarge the whole nasal structure, compressing the middle turbinate bone against the septum and dilating the middle meatus. A polypus may arise within the maxillary sinus from swelling of the sinus mucosa; this may herniate through an accessory ostium and enter the nasal cavity and grow to enormous size. I have seen one such polypus present both through the nasal vestibule in front and into the pharynx through the choana posteriorly. In my opinion nasal and antral polypi are a manifestation always of allergy and never of straightout infection. In addition to true polypi, pronounced œdema of the free edge of the middle turbinate bone gives rise to a polypoidal swelling closely resembling a true polypus arising from the middle meatus. If the underlying cause of the condition is constant and long-standing, the inferior turbinate bone may undergo permanent changes, resulting in marked hypertrophy throughout its length. The posterior ends may enlarge to a degree sufficient almost to fill the choana. The result of this swelling of the intranasal structures is to produce a condition of stasis in the nasal and sinus cavities. When this stasis occurs, the blanket of mucus which covers the membranes, and which normally should constantly be moved backwards by the action of the cilia, ceases to flow. This cessation of movement of the mucus encourages the development of infection. The mucosa becomes inflamed and pus cells are poured out to mix with the mucus; the nasal and sinus cavities become filled with muco-purulent discharge. This latter condition is the ultimate result of long-standing and constant exposure to the effects of definite specific allergens *plus* superadded infection. When the exposure is intermittent this final picture is not produced, the reactions being subject to remissions, with the result that between attacks the mucosa returns to normal, function is not interfered with, and infection does not occur. On examination the appearances observed vary considerably; in the post-nasal space one may see a swollen œdematous inferior turbinate and septum, or the posterior end of the inferior turbinate bone may have a nodular appearance—the so-called "mulberry" hypertrophy. In the nose the mucosa may look pale, swollen and watery, or it may have a bluish tinge, and sometimes there is no swelling at all and the mucosa looks unusually red. In long-standing cases the inferior turbinate may be greatly swollen, with a hard brawny feel when touched with a probe; the middle turbinate may be polypoidal, or actual polypi may be present, and where infection has occurred the swollen tissues are bathed in muco-purulent discharge. Deformities of the septum should be looked for, as a large sharp spur pressing into the medial side of the inferior turbinate bone sometimes has a very marked effect in maintaining nasal symptoms and those of asthma.

The cause of the condition is in most cases a sensitivity to specific allergens, which fall under the three main headings of inhalants, foods, and bacterial allergens. The inhalants include pollens, moulds, dusts, powders, sawdust *et cetera*. The specificity of the inhalants can be proved most easily by skin tests, but foods also can be suspected if not proved by this means also. Vasomotor conditions also appear to be responsible to a certain degree, while endocrine dysfunction is suspect in a certain class of case in which no definite specific cause can be ascertained. Bacterial allergy appears to be difficult to prove, but the improvement sometimes noted after removal of septic foci indicates that it may be a potent factor in ætiology. In addition to these causes, physical agents such as light, cold and heat play a definite part in causation.

The symptoms characteristic of the complaint are intranasal irritation, sometimes amounting to actual pain, paroxysmal attacks of sneezing, rhinorrhœa and nasal

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on May 25, 1950.

obstruction. The intranasal irritation is frequently associated with irritation of the conjunctiva. The sneezing attacks frequently occur on the subject's rising from bed, and thereafter may be absent for the remainder of the day. They may occur, however, at any time and may be so severe as to prostrate the patient. The rhinorrhœa usually follows the first few sneezes and may come on with disconcerting and embarrassing suddenness, there being a gush of thin, watery fluid from the nose before the patient can apply his handkerchief. It may be so profuse as to saturate several handkerchiefs in the course of a very short interval of time. In attacks of longer duration, although the discharge is not so profuse, the patient complains of a constantly wet nose. The nasal obstruction may vary from an intermittent, alternating, unilateral blockage of short duration to a complete bilateral obstruction, the patient not being able to force any air through the nasal passages at all. This, of course, is a most distressing condition which may persist for several days on end; it causes the patient the most acute discomfort, producing a feeling of fullness in the head and ears and affecting his mentality. This state of affairs can be caused by an acute swelling of the whole nasal mucosa, quite apart from the development of polypi. The latter are a manifestation of chronic or long-standing nasal allergy; they cause obstruction of varying degree from a ball and valve type to complete and constant blockage, according to the number and size of the polypi. When infection occurs, there may be the headache that is usually associated with sinusitis and a post-nasal and nasal discharge of mucopus. The sensations of smell and taste are, naturally, interfered with.

Treatment can be divided into two divisions, namely, local and general. With regard to local treatment it can, I think, be said that the less interference with the structures inside the nose the better, and the same holds good for local applications in the form of drops, sprays or inhalations. There are, however, certain conditions which call for active local treatment to augment or hasten the response to general treatment. In order to afford relief in acute nasal obstruction, for example, it is permissible to use some vasoconstrictor drugs; adrenaline, of course, should never be applied to the allergic nose on account of the distressing reactions that follow its application. "Neosynephrine" 0·25% or 1% solution is useful in affording temporary relief, but it should not be employed once an airway has been reestablished. When the inferior turbinates are chronically hypertrophied, the soft tissues can be anchored down to the bony framework just as linoleum is tacked down to the floor of a room, by cauterizing the medial surfaces in two parallel lines along their long axis. Polypi, when large, must be removed in order to afford an airway; they may be removed under local anæsthesia if few in number, but when there are many it is advisable to give a general anæsthetic in hospital. It is sometimes of advantage to exenterate the ethmoidal labyrinth at the same time, chemotherapy being employed to obviate the complications which sometimes follow operations in this region. In my experience, polypi have been observed to shrink up considerably, if not to disappear completely, after the administration of a specific extract. The operation which frequently pays dividends is the submucous resection operation of the septum to remove the sharp spur to which I referred previously. I have seen two or three patients who were relieved of distressing asthma (one, indeed, was in *status asthmaticus* and was referred to me in desperation by a leading allergist) by the removal of such a spur. Where superadded infection of the sinuses has occurred it is frequently necessary to perform more radical operations and at the same time to use every means possible to cure the underlying allergy.

I think I may leave a description of the general treatment to the allergists, to whom we owe a debt of gratitude for their help and cooperation in the treatment of these cases. The administration of specific extracts, desensitization to histamine, treatment with the antihistamine drugs and other measures, have considerably improved the outlook for those people who are unfortunate enough to suffer from this complaint.

ACUTE MYOCARDITIS.

By K. M. BOWDEN,
Melbourne.

THE main purpose in reporting the following examples of acute myocarditis is to emphasize this condition as a clinical and pathological entity, and as a cause of sudden and unexpected death. It is of particular interest in children as it is the cause of some sudden and unexpected deaths in infancy (House, 1948; Bowden, 1950).

The term "acute myocarditis" is used here in the sense of a non-specific acute inflammatory reaction involving any part of the myocardium, muscle or interstitial tissue. We exclude thereby, for the purposes of this discussion, the myocarditis of acute rheumatism and metastatic abscess-formation, as a complication of a pyogenic focus elsewhere in the body and direct spread into the myocardium from an adjacent focus.

Illustrative Reports of Cases.

These cases are selected to show that acute myocarditis occurs in either sex at any age period. Only the relative autopsy findings are given in summary form.

CASE I.—R.B., aged twelve days, was examined by a doctor at 11 a.m. on September 18, 1949, because he was off his food. He was revisited at 6 p.m. that day just after he had vomited and been taken ill. The doctor treated the child for asphyxia, but was unable to revive him; the child was dead on arrival at hospital. Autopsy revealed an undernourished child, weighing six pounds four ounces. The heart was a little enlarged with dilatation chiefly of the left ventricle; the muscle was pale; the foramen and ductus were still patent. The trachea and bronchi contained some frothy fluid; fine petechiæ were seen on the surface of the lungs. An enlarged gland was found at the bifurcation of the trachea. Microscopic examination of the heart showed œdema, capillary congestion, cloudy swelling and necrosis of muscle fibres, with loss of striation, vacuolation and complete disappearance of others. Heavy infiltration of the myocardium had occurred with polymorphonuclear and eosinophile cells, young fibroblasts and macrophages. A lacework appearance was left from disappearance of muscle substance. The lymph gland contained evidence of early acute inflammation. The diagnosis was acute myocarditis.

CASE II.—W.R., a male baby, aged four months, began to vomit at 8 p.m. on January 6, 1950, after the evening meal of "Lactogen". He slept through the night, awaking about 6 a.m., and was fed again with "Lactogen", but was disinclined for food. He did not appear to be his normal self. About 11.30 a.m. that morning a purple-blue rash appeared on the body. The parents rushed the child to hospital, but he was dead on arrival. Autosy revealed the body of a well-nourished male baby with a purplish-blue blotchy rash on the skin. The heart was a little dilated and its muscle very pale; structurally it was normal. The lungs were rather rubbery to the feel. Enlarged glands were found along the bronchial tree near the hilus. The larynx was congested. The liver was mottled and pale in places. Microscopic examination of the lungs revealed a virus type of pneumonia with bronchial and peribronchiolar accumulation of monocytic cells. The heart contained evidence of acute myocarditis of a patchy nature; there were areas of necrosis of heart muscle, which had been replaced by accumulations of eosinophile cells, mononuclear cells and lymphocytes, with dilated engorged capillaries and patchy infiltration of cells between bundles of muscles and between individual fibres. The liver contained many polymorphonuclear cells in the sinusoids and capillaries with focal collections of round cells in the portal tracts. The diagnosis was virus pneumonia and acute myocarditis.

CASE III.—R.A., a male baby, aged eleven months, who was said to have been in good health, awakened at 3 a.m. on August 7, 1949, and appeared to be restless. About 6 a.m. he was given a bottle of milk, which he drank, and then he appeared to go to sleep. When his father awakened at 7 a.m. the child was lying face downwards apparently dead; he was dead on arrival at hospital. Autopsy revealed the body of a well-developed, well-nourished male baby. The heart was a little enlarged with dilatation of the left ventricle and noticeably pale muscle. Slightly enlarged glands were found about the hilus of the lungs and in the mediastinum at the bifurcation of the trachea. Microscopic

examination of the lungs showed a virus type of pneumonia with peribronchial and peribronchiolar infiltration of lymphocytes and mononuclear cells. The heart muscle contained all degrees of change, with infiltration by lymphocytes, endothelial cells, eosinophile cells, macrophages and some giant cells. The diagnosis was virus pneumonia and acute myocarditis.

CASE IV.—C.W., a female baby, aged twenty months, ate her tea as usual at about 6.30 p.m. on July 27, 1949, and then started to cry. A few minutes later she went pale and limp, and was taken to a neighbour's house and placed in a mustard bath. She responded to this treatment and was taken to a doctor, who gave her a hypodermic injection and performed artificial respiration, but she failed to respond. She was taken to a public hospital, and life was pronounced extinct. Autopsy revealed vomitus in the left main bronchus and in the finer bronchioles. The heart was a little dilated and pale. The stomach was overdistended with partially digested food. Microscopic examination of the heart showed infiltration of the myocardium with endothelial cells, lymphocytes and young fibroblasts; a lacework of supporting connective tissue was left from dissolution of heart muscle—the usual changes seen in muscle fibres accompanying acute inflammation. The lungs contained evidence of bronchitis and bronchiolitis with polymorphonuclear cells in the walls. The diagnosis was acute myocarditis, acute bronchitis and bronchiolitis.

FIGURE I.

Acute myocarditis in a baby, aged twelve days, who was found dead in bed. Pale, swollen muscle fibres with some necrosis and infiltration with cells. (Medium power.)

CASE V.—E.J., a male patient, aged nineteen years, consulted a doctor on November 27, 1948, when he complained of sore throat for the past two days. He had a temperature of 100° F. and was thought to be suffering from acute follicular tonsillitis. Sulphadiazine was prescribed. He was again examined on November 29, when his temperature was normal, the inflammation in his throat was subsiding and his tonsils were smaller. At 8 p.m. on the same day he suddenly died. At autopsy his heart was found to be a little enlarged and weighed 16 ounces; the left ventricle was dilated, the muscle was pale and of a toxic appearance, and early atheroma of the ascending aorta was present. The lungs contained œdema with frothy fluid in the air passages. The result of examination of a smear from the tonsils was inconclusive, when it was stained for organisms. The tonsils showed signs of acute inflammation. The result of analysis for poisons was negative. Microscopic examination of the heart showed œdema, loss of striation and destruction of muscle fibres, with heavy infiltration of the myocardium with polymorphonuclear, eosinophile and small round cells and macrophages; some fat was present in the tissue spaces. (See Figure III). The diagnosis was acute tonsillitis and acute myocarditis.

CASE VI.—J.G., a female patient, aged twenty-one years, suddenly became ill and complained of pain in the lower part of the back and across the lower part of the abdomen, especially over McBurney's point. Her pulse rate was 54 per minute and her temperature 97·8° F. No neck stiffness was found; her knee jerks were accentuated. She complained of pains in both thighs, more on the anterior aspects. Next day she vomited once. The following day she had a fit, which lasted five minutes; she rolled her eyes, but did not bite her tongue. Her pulse rate was 100 per minute and her temperature was 101° F. Her legs were flaccid and knee jerks were absent. Her blood pressure was 180 millimetres of mercury (systolic) and 160 millimetres (diastolic). At this stage her condition was regarded as being possibly due to encephalitis or uræmia. Another fit occurred that day and lasted seven minutes. The cerebrospinal fluid contained three red blood cells per high-power field and 15 milligrammes of protein per 100 millilitres. One week later the blood pressure was 175 millimetres of mercury (systolic) and 140 millimetres (diastolic); all reflexes were sluggish but present. She was given sulphadiazine one gramme three times a day. Sixteen days after the onset of illness the girl was running a slightly raised temperature and was thought to be suffering from polyneuritis. The knee jerks were still absent, but the superficial abdominal and ankle jerks were present. Nineteen days after the onset of the illness she died suddenly whilst in bed. At autopsy her heart was found to weigh 12 ounces; the left ventricle was dilated, the coronary vessels were normal, and scattered through the myocardium were tiny, pale, discrete areas

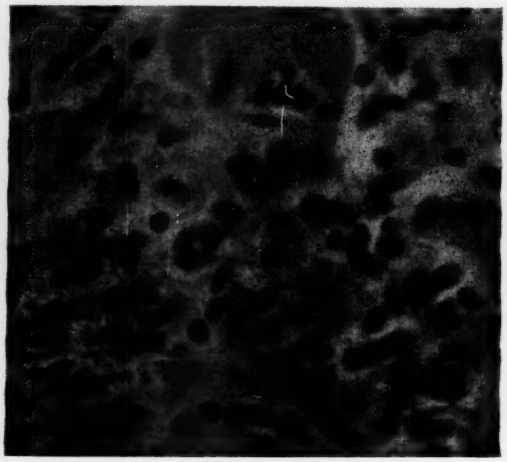

FIGURE II.

Acute myocarditis in a child, aged twenty months, who died suddenly. (Medium power.)

resembling tiny areas of muscle necrosis. Some pulmonary œdema was present with some tiny subpleural hæmorrhages. The organs were analysed for poisons, but the result was negative. Secretions were cut of heart, peripheral nerves, kidney, brain and spinal cord. There was minimal perivascular cuffing along some vessels in the median nerve. There was no evidence of any lesion in the brain or spinal cord. The heart contained evidence of acute myocarditis, but at a much later stage than in the foregoing cases. Many muscle fibres had disappeared and were replaced by an open lacework of supporting connective tissue with scattered cells, mostly lymphocytes and mononuclear cells. The heart muscle had been seriously affected. The diagnosis was acute myocarditis. (See Figure IV.)

CASE VII.—A.C., a male patient, aged thirty-three years, was discharged from a repatriation hospital three weeks before his death; he had been in hospital for three weeks and was treated for hookworm and amœbic dysentery with carbon tetrachloride ethyl and emetine. He was again admitted to hospital at 8 p.m. on June 9, 1949, after an accident in which he sustained fractures of both bones of the right leg. Anæsthesia was induced at 11.20 p.m. on the same evening with intravenous administration of "Pentothal" followed by cyclopropane. At 12.25 a.m. his pulse deteriorated and death ensued. At autopsy his heart was found to weigh 12 ounces; coronary arterial disease was absent; the pericardial sac was clear; the myocardium was flabby and pale in colour; the left ventricle was grossly dilated, but the right was of normal size; the margins of the mitral valve flap were a little thickened. Dense pleural adhesions were present over the anterior and lateral surfaces of both lungs; the interlobar fissures were obliterated by adhesions. The

trachea was a little bruised below the vocal cords. Microscopic examination showed the heart muscle fibres to be hypertrophied and fragmented, with cloudy swelling and loss of striation, separation of the fibres by a loose connective tissue, cellular infiltration with round cells, endothelial cells and fibroblasts, and an increase in supporting connective tissue; in many areas the fibres had disappeared, being replaced by connective tissue. The diagnosis was recent non-specific myocardial inflammation.

CASE VIII.—M.S., a female patient, aged fifty-five years, was admitted to hospital on August 20, 1949, with clinical poliomyelitis. Three days before she had developed pains in the thighs and back. For two days she had been unable to stand on tip toes and during those two days her legs had become almost completely paralysed. The doctor who sent her to hospital said that she had had a high blood pressure. She had also had a tuberculous right shoulder joint and effusion into the right knee joint. Clinically the poliomyelitis was affecting the muscles of both legs and both arms, and the intercostals. She developed retention of urine followed by severe cystitis; coliform organisms were isolated. She was treated with sulphamerazine and streptomycin, and had to be placed in a respirator. Her pulse rate varied; the highest rate recorded during her period in hospital was 100 per minute. A week before her death the patient developed

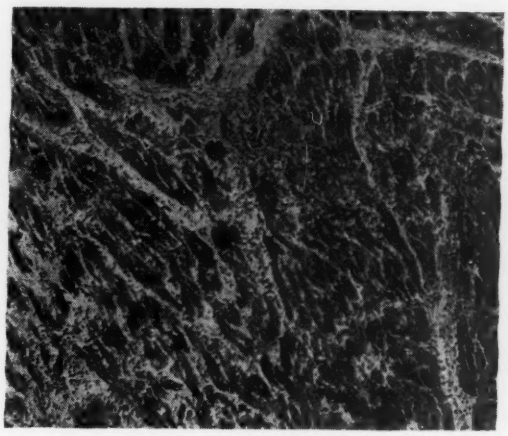

FIGURE III.

Acute myocarditis in a youth, aged nineteen years, who had been ill for a few days. Heart muscle heavily infiltrated with cells. (Low power.)

cyanosis, which increased irrespective of whether she was in or out of the respirator. She died on November 5. A section of this woman's heart is illustrated in Figure VII. There had been extensive destruction of heart muscle with replacement by connective tissue supporting a few scattered lymphocytes and large mononuclear cells. Around the blood vessels there was a considerable increase in the amount of connective tissue, and there were still accumulations of large mononuclear cells about some of the vessels. A collection of cells still present about a blood vessel is shown in Figure VII.

CASE IX.—M.W., a female patient, aged sixty-six years, was examined on August 17 and 25 and September 1, 1949. She died on November 2 in bed. She had complained of weakness and had a history of recent chronic alcoholism. On August 17 the systolic blood pressure was 100 millimetres of mercury and she had peripheral neuritis. No sugar was found in the urine. She was very weak for two days prior to death, complaining of palpitation. Post-mortem examination of her heart showed both ventricles to be moderately dilated, with increased subepicardial fat; the coronary vessels were normal. The liver was a little enlarged with a nutmeg appearance. Multiple faceted calculi were found in the gall-bladder. The result of analysis of the organs was negative for poisons. Microscopic examination of the heart showed the fibres to be hypertrophied with patchy necrosis. Changes had occurred in the fibres—cloudy swelling, vacuolation, necrosis and disappearance—with separation of the fibres by connective tissue, which was infiltrated with cells (lymphocytes, endothelial cells, macrophages and young fibroblasts). Minimal thickening of small vessels had taken place with perivascular accumulation of hyalinized basophilic material. The diagnosis was myocardial inflammation.

CASE X.—M.B., a female patient, aged fifty-four years, was admitted to hospital on July 3, 1949, and died ten days later. She came to hospital with a diagnosis of virus pneumonia and a history of hacking cough and feverishness of ten days' duration. She was weak and trembling and coughed up yellow sputum, at times slightly blood stained. Her blood pressure was 120 millimetres of mercury (systolic) and 70 millimetres (diastolic). Scattered sounds were audible in both sides of the chest. Her temperature was up to 103° F. An electrocardiogram suggested left bundle block. Some pleural fluid was present in the chest. Autopsy revealed a well-built subject. The heart weighed 14 ounces. Twenty millilitres of turbid pericardial fluid were present, the pericardial surface over the left ventricle was grossly congested, and a little fibrin could be scraped off the surface of the heart. Gross coronary atheroma was found. The left lung weighed 23 ounces, the right 24 ounces. Old pleural adhesions were present, with 300 millilitres of clear fluid in

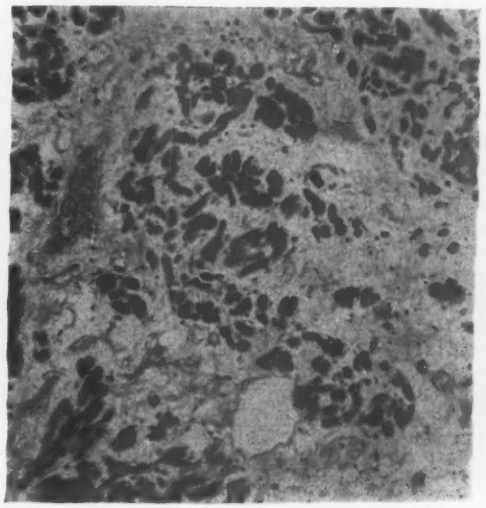

FIGURE IV.

The myocardium nineteen days after the onset of illness in a girl, aged twenty-one years. Widespread change with replacement of muscle by a lace-work of connective tissue supporting a few scattered cells. (Low power.)

the pleural cavities. The right lung was rather firm yet air-containing. The lung tissue was denser than normal. The trachea and bronchi were injected. The stomach had a small erosion in the lesser curvature in the upper portion of the fundus. Microscopic examination of the heart showed hypertrophy of the fibres with all changes from cloudy swelling to necrosis and dissolution; cells present were myogenic giant cells, eosinophile cells, polymorphonuclear cells, plasma cells and small round cells, with many fibroblasts. The diagnosis was virus pneumonia and acute myocarditis

Histopathology.

In the cases described, the lesion is non-specific. The muscle and interstitial tissue share in the inflammation. The muscle fibres show all degrees of change from cloudy swelling and loss of striation to complete destruction and disappearance. In some areas a few fibres remain in an ocean of connective tissue. There is loss of staining with eosin, vacuolation and pyknotic nuclei, with some nuclei which appear to be dividing longitudinally, suggesting an attempt at regeneration of muscle. Muscle cells show vacuolation with spaces appearing in the cell, leaving a thin rim of muscle substance around the periphery. In the later stages the muscle substance has entirely disappeared, leaving as it were only the sarcolemma, and producing a lace-work or patterned appearance. Some of

these areas have the appearance of adipose tissue where muscle cells appear, with the loss of their muscle substance, to have turned into fat cells. A pearly-grey hyaline basophilic stroma of connective tissue is seen separating muscle bundles and individual muscle cells. A few mononuclear cells situated in a lace-work of connective tissue remain after the initial response is over; the picture suggests dissolution and disappearance of muscle substance, leaving a stroma of connective tissue with some scattered mononuclear cells. There occur small round cells, large mononuclear cells, phagocytic cells, eosinophile cells, polymorphonuclear cells, and some giant cells. The new cells have no special arrangement—they lie between muscle bundles or between individual fibres or in groups replacing muscle fibres. In poliomyelitis the cells tend to be grouped about the vessels (Figure VII). The capillaries show gross congestion; some of them have ruptured with surrounding extravasation. In the later stages the capillaries and arterioles may show a little thickening from hyperplasia of the intimal lining.

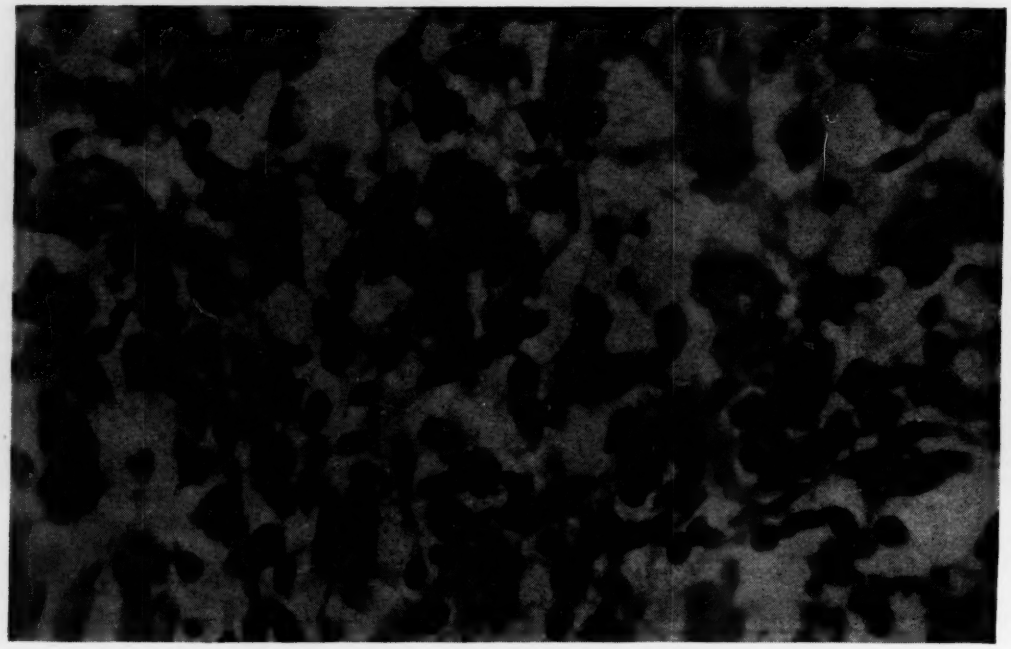

FIGURE V.

The myocardium of a woman, aged fifty-four years, who was ill for ten days. It shows round cells, muscle destruction and a giant cell at the left. (High power—600.)

Clinical Picture.

Myocarditis may pass unnoticed clinically; on the other hand frank cardiac failure with œdema may occur, with its attendant clinical picture. Various arrhythmias are encountered. An unexplained bradycardia or tachycardia out of all proportion to the associated disease suggests myocardial involvement. Dyspnœa, cyanosis and low blood pressure may be prominent. The electrocardiogram may be abnormal. The course is generally rapid, and sudden death is characteristic. On the other hand the illness does last for months, and recovery may take place after there has been serious involvement of the heart muscle.

Discussion.

The terminology is unsatisfactory, for acute myocarditis is usually briefly dealt with in text-books in association with the infectious fevers under the classification of acute parenchymatous and acute interstitial lesions. In acute interstitial myocarditis, one finds as well varying amounts of damage to muscle; in fact, the myocardium may show profound muscular change as an accompaniment of predominantly interstitial inflammatory reaction. In what is called predominantly parenchymatous myocarditis, there will be found interstitial changes, and there may be extensive infiltration of new cells between the muscle bundles and the individual muscle cells. When there is chiefly a parenchymatous lesion, some secondary cellular change as a reaction to the damaged muscle cells is to be expected. However, even in diphtheria, in which the lesion is usually described as a parenchymatous one, there may be a heavy infiltration of the myocardium with different types of cells, the cells usually accompanying acute inflammation, and much more than might be reasonably explained on the basis that the cells have appeared secondarily to deal with the damaged or dead muscle. It is said that it is incorrect pathologically to speak of acute inflammation affecting the heart muscle by itself, because strictly speaking acute inflammation is a response in a vascular tissue. In addition, it has been emphasized that the changes affecting the muscle only—necrosis of muscle cells, for example, produced by the toxins of diphtheria—should be regarded as acute necrosis or myocardial degeneration, rather than as true acute inflammation. In the cases of acute myocarditis described in this paper as a cause of sudden death, the muscle was demonstrably affected and there was interstitial involvement. It is for this reason that these cases are described as acute myocarditis, the distinction being abandoned here of parenchymatous and interstitial lesions (pathological hair-splitting) and the myocardium being regarded as a whole, muscle and interstitial tissue reacting as a whole (myocardial inflammation) in a variety of diseases.

If we leave aside the acute infectious fevers, acute inflammation of the myocardium is not uncommon, although it is not often diagnosed clinically and is usually found only after microscopic examination of the heart at autopsy. That the condition is often not diagnosed clinically may be due to unawareness of its likelihood and pathologically to the fact that commonly there is little to indicate on naked-eye examination of the heart at

autopsy that acute myocarditis is present. Unless the heart is sectioned as a routine at autopsy, many cases will be missed. In two recent autopsy cases in which there was purulent meningitis, routine sections of the heart showed also acute myocarditis with death of muscle and cellular infiltration. Possibly also the lack of awareness of acute myocarditis as an inflammatory phenomenon is in some measure due to the past incorrect use of the term "chronic myocarditis" and the efforts made to eliminate this. Pathological lesions in the heart were previously called chronic myocarditis, when in fact they were not true examples of chronic inflammation, following an acute myocardial inflammatory process such as is here described.

Acute myocarditis is found as an isolated entity in the myocardium or as a complication of or part of a disease process affecting other parts of the body. Isolated myocarditis, without involvement of the pericardium or endocardium, is referred to as Fiedler's myocarditis because it was described by him in 1899. Although Fiedler used the term "acute interstitial myocarditis", there were parenchymatous changes with necrosis of heart muscle in his material. Isolated or Fiedler's myocarditis has many

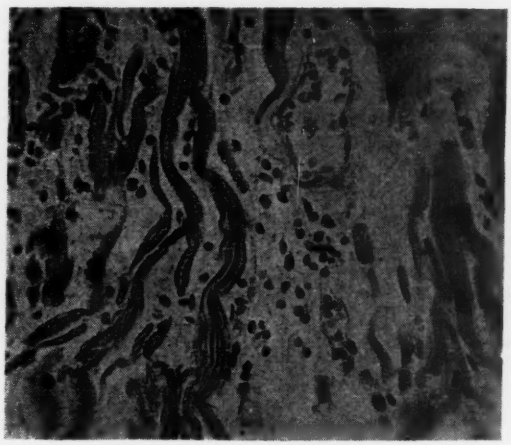

FIGURE VI.

The myocardium in a woman, aged sixty-two years. Necrosis of muscle cells and infiltration. (Medium power.)

synonyms, such as primary, interstitial, circumscribed, diffuse, allergic and idiopathic. In addition to the acute lesion there is the less common isolated lesion of the myocardium in which the histological pattern is that of a granuloma resembling the granulomatous lesion of syphilis or tuberculosis, but in these cases neither the *Treponema pallidum* nor the tubercle bacillus has been demonstrated. The lesions of Boeck's sarcoidosis also affect the myocardium. Cairns (1950) found non-specific myocarditis in which there was heavy cellular infiltration of the heart wall in a child aged five years. Autopsy showed tuberculous peritonitis and tuberculous meningitis as the cause of death, and yet the histological picture in this child's heart was the same as that seen, for example, in the acute myocarditis of typhus fever.

It should also be borne in mind that every part of the myocardium may not be involved. The inflammatory reaction may be pronounced in one block of tissue cut from the heart and may be virtually absent from another block. This was brought home to us in the examination of the heart at autopsy in a fatal case of poliomyelitis. In one block of tissue cut from the left ventricle, it would have taken an experienced observer to find evidence of myocardial inflammation, but in an adjacent block of tissue the inflammatory response was very pronounced—so that this should be remembered when the term "diffuse myocarditis" is used. The lesion may be widespread in the myocardium without diffuse involvement in the sense that every part of the myocardium will show similar change.

Inflammation of the myocardium occurs as a complication of or as part of the pathological picture in a wide variety of diseases. It occurs in virus diseases, such as influenza "A" infections (Finland, 1945), epidemic encephalitis, mumps and poliomyelitis. In a series of 5626 consecutive autopsies carried out at Chicago, routine sections were cut from the heart, not directed towards any special study. Saphir (1941) found in this routine material acute myocarditis present in 240 hearts. He reviewed the literature on the subject, which is extensive, and in his review discussed acute myocarditis occurring as a non-specific inflammatory reaction in a wide variety of conditions.

There have been some interesting studies of acute myocarditis in poliomyelitis, following the use of "sulpha" drugs (French and Weller, 1942), and in rabbits deficient in vitamin *E* (Bragdon and Levine, 1948). Schmidt (1948) isolated a virus from a chimpanzee that had died of acute interstitial myocarditis (with similar autopsy findings to

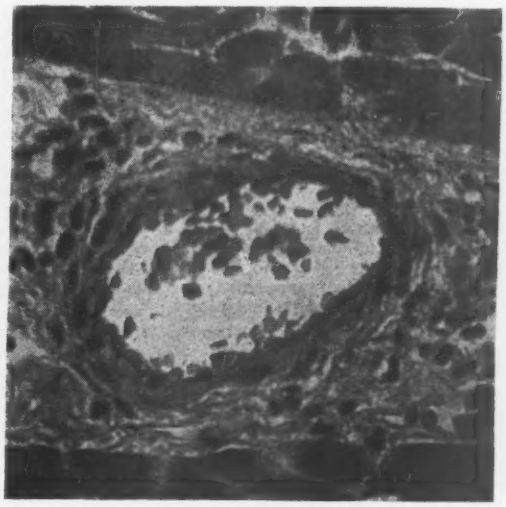

FIGURE VII.

Myocarditis in a case of poliomyelitis in a woman, aged fifty-five years, who was ill for nearly three months. The changes around a vessel and the cell accumulation about the vessel are illustrated. (Medium power).

those of the woman aged fifty-four years described last in this paper), and with this agent he was able to produce myocarditis and encephalitis in mice and myocarditis in guinea-pigs. The lesions produced in the heart varied from slight perivascular lymphocytic infiltration to advanced myocardial necrosis with polymorphonuclear infiltration. The agent was specific and potent with intravenous, peritoneal, subcutaneous, intranasal and intracranial instillation.

In the recent poliomyelitis outbreak in Victoria, in seven cases bulbar poliomyelitis was found by routine section to be the unsuspected cause of sudden death of subjects brought to the Melbourne City Morgue. In six of these the heart was examined microscopically, but in one case only was there frank acute myocarditis; in one other the changes in the heart could have been described as minimal acute myocarditis. In four other hearts made available from cases in which death occurred in hospital from poliomyelitis, there was frank acute myocarditis in all.

In the case mentioned in which death was due to bulbar poliomyelitis, lesions were found in the brain stem, the lungs, the heart and the liver. The lesions in poliomyelitis are not confined to the nervous system. The lung in this case, that of a girl of thirteen years, showed early virus pneumonia with peribronchial and peri-

bronchiolar infiltration with mononuclear cells and little involvement of the lung parenchyma. The liver also showed an abnormal accumulation of mononuclear and lymphocytic cells, especially about the blood vessels in the portal tracts. The lesion in the heart was interesting because it bore a strong resemblance to the condition of the heart in active acute rheumatism. There were collections of cells adjacent to blood vessels which could have been interpreted as Aschoff nodules; there was in addition pronounced destruction of the heart muscle. In one patient who died from clinical poliomyelitis in hospital, there were lesions in the heart, liver, meninges, brain stem and spinal cord. The changes in the heart were those of acute myocarditis with cells between the muscle fibres and connective tissue replacement, and the changes were greatest about the blood vessels. There were also collections of mononuclear cells and lymphocytes in the portal tracts of the liver. The association of the lesions particularly about the blood vessels in the myocardium illustrated in Figure VII may be one of the distinguishing features of the myocarditis of poliomyelitis.

In a careful search for the cause of death in babies found dead in bed or in the cot, five examples of acute myocarditis were found in a consecutive series of 50 babies. The youngest was aged twelve days; the others were aged four months, eleven months (two) and twenty months respectively. In one of these only was the condition suspected on naked-eye examination, because the heart muscle was pale and the left ventricle dilated. There was an enlarged gland at the bifurcation of the trachea in one of these babies and it showed early acute inflammation. In four babies there was associated bronchitis and bronchiolitis, in three cases of the virus type, in the other pyogenic. In none was the endocardium or pericardium involved, so that the condition of one of them could have been labelled isolated myocarditis, as microscopic lesions elsewhere in the body were not found.

It is the common experience when autopsies are being carried out to find very little on gross examination, and acute myocarditis may be revealed only with the microscope. For this reason and because of the very great lack of opportunity in a government morgue for carrying out thorough investigations, we have missed the opportunity for making cultures, so that until recently the opportunity to demonstrate the virus ætiology in any of these cases was lost. Professor S. D. Rubbo, of the University of Melbourne, stained sections from six consecutive cases of acute myocarditis in a search for organisms, but in only one were organisms detected. This was the case of a man who was attending hospital because of a lump on his back. Whilst the lump was being investigated, he died suddenly. Autopsy showed that the lump was an abscess, and examination of his heart showed staphylococcal myocarditis.

Acute myocarditis was found in three persons who died during anæsthesia.

A child suffering from acute myocarditis died during anæsthesia for tonsillectomy.

A baby girl of five months was operated on for a dermoid cyst in the pelvis. She was progressing favourably, and forty-two days after the original operation she was given "a whiff" of ether in order to probe the wound, as it was suggested that there was a collection of pus at the operation site. The child died during the "whiff". Microscopic examination of her heart showed acute myocarditis, probably of secondary origin to the infected operation site.

The other example has been described, that of a man of thirty-three years who was involved in a motor-cycle accident, sustaining a fractured right tibia and fibula.

In another instance, a girl of twenty-two years was about to board a tram on her way home from work when she fell dead. Inquiries elicited the fact that this girl had not had medical attention for any illness in her life. Autopsy showed a slightly enlarged heart due to a dilated, very thin ventricle with mitral incompetence. Nothing else that was considered abnormal was found. This type of heart suggested previous myocardial inflammation and this was confirmed by microscopic examination. In four blocks examined, the muscle fibres were thin and separated by connective tissue supporting a few mononuclear cells. There was some patchy necrosis of heart muscle where the muscle fibres were replaced by well-formed fibrous tissue. The histological picture was non-specific, and was thought to present an example of previous acute myocarditis.

Our observations at the City Morgue do not enable any reliable conclusion to be drawn as to the incidence of acute myocarditis in sudden and unexplained deaths, other than in babies, because we have not examined sections of the heart as an autopsy routine.

Conclusions.

Acute myocarditis is sufficiently common to warrant more interest than has been paid to it in the past by pathologists and clinicians.

Histologically similar types of myocarditis occur in a wide variety of diseases. Careful investigation may serve in the future to sort out of this non-specific picture specific disease processes.

Acknowledgements.

I am indebted to Dr. J. D. Hicks, pathologist at Prince Henry's Hospital, Melbourne, for the details of the last case described in this paper. Dr. A. Ferris, pathologist at the Infectious Diseases Hospital, Fairfield, provided the material from the patients who died of clinical poliomyelitis and permitted me to refer to it. Dr. E. Harbison, of Balaclava, provided me with his clinical notes on the sixth case described. Professor S. Rubbo assisted me in a histological search for organisms in some of our material. I am indebted to Professor R. D. Wright for assistance with this work. The sections were prepared at the City Morgue by the technician, Mr. H. A. Quigley.

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OBSERVATIONS ON THE VERTEBRAL AND BASILAR ARTERIES AND THEIR BRANCHES IN MAN, WITH SPECIAL REFERENCE TO THE LATERAL PAROLIVARY FOSSA.[1]

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Sydney.

MATERIAL AND METHODS.

THE results to be discussed are based on an investigation of 42 brain stems. These specimens were from the human European.

The arterial system of many of the 42 specimens was obviously incomplete owing, it is presumed, to their treatment at removal. I did not witness the removal of these specimens from the body. This meant that the arterial system of all the specimens was to be regarded with suspicion as being possibly incomplete; this suspicion was particularly necessary in connexion with the smaller arteries. Therefore, the absence of a certain feature could be asserted only with this reservation.

[1] Work done with the aid of a grant from the Wait Scholarship and the National Health and Medical Research Council.

In a similar manner, I had to assume that the anatomical relations of many of the structures might have been altered during the processes of removal and preservation.

The specimens were preserved in 10% formalin solution. The arteries were investigated by simple dissection.

Discussion of Results.

The Arteries to the Lateral Parolivary Fossa.

The lateral parolivary fossa (Figure I) is a region bounded posteriorly by the restiform body, medially by the olive, superiorly by the lower end of the pons with the emerging facial and auditory nerves, and laterally by the cerebellum, particularly the flocculus; against the lateral boundary of the fossa is the lateral recess of the fourth ventricle, like a pouch, with the chorioid plexus usually visible; lying against the medial side of cerebellum, pouch and plexus, are the emerging rootlets of the glossopharyngeal and vagus nerves.

The fossa opens inferiorly into a channel between the cerebellum laterally and the lateral aspect of the *medulla oblongata* medially. The dividing line between the channel and the lateral parolivary fossa I will define at the mid-olivary level.

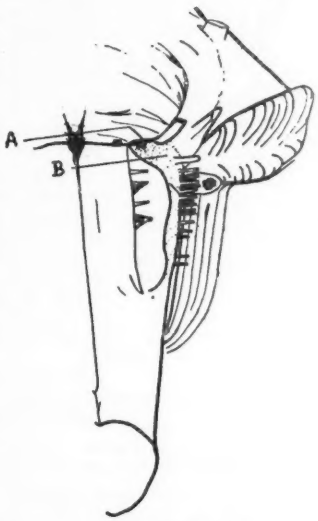

Figure I.

A = inferopontine fossa. B = lateral parolivary fossa. (The figures in this paper have not been drawn to scale.)

Usually, the inferior end of the pons in that part above, and above and lateral to the olive, bulges down anteriorly to the medulla, then recedes a little superiorly and posteriorly to join the medulla. The fossa extending up behind the overhanging lower end of the pons I will call inferopontine. Medially, it extends as far as the pyramid; laterally it extends, often as far as, sometimes laterally to, the facial nerve root; in the latter case, this fossa will include in its anterior wall and roof emerging fibres of the facial nerve. The fossa is variable in depth, lateral extent and volume. The inferopontine fossa is the superomedial part of the lateral parolivary fossa.

Böhne (1927), describing the arteries of the *medulla oblangata*, stated that the posterior inferior cerebellar and the basilar arteries gave branches to the upper lateral part of the medulla. He referred back to the work of Foix, Hillemand and Schalit (1925), who named an *arteria fossæ lateralis bulbi* supplying the lateral field of distribution of the medulla.

Luna (1929) challenged Böhne's nomenclature and claimed to have named arteries to the upper lateral part of the medulla in 1915. He found a close anastomotic net on the surface of the medulla, lateral to the olive and in the immediate region of the facial, auditory and glossopharyngeal nerve roots. The branches contributing to this net were from the vertebral and posterior inferior cerebellar arteries, the basilar and the anterior inferior cerebellar arteries.

Alexander and Suh (1937) named three arteries supplying an arterial net on the posterior surface of the lateral parolivary fossa: the anterior artery, one or two intermediate arteries, and the posterior artery of the lateral parolivary fossa. The anterior artery arose from the basilar directly as its most caudal branch, or together with the anterior inferior cerebellar artery, or with this artery and the internal auditory artery. The intermediate artery arose as a direct branch from the vertebral artery and was sometimes doubly represented. The posterior artery was a branch of the posterior inferior cerebellar artery.

In three of the 12 specimens they studied, the arrangement on one side was atypical. In two, with no posterior inferior cerebellar artery on one side, there was no posterior artery of the lateral parolivary fossa. In one, the anterior artery was absent.

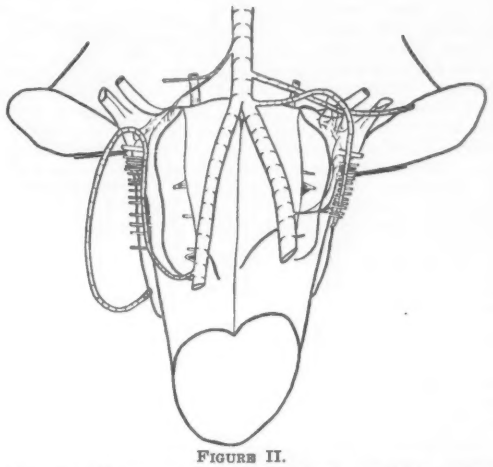

Figure II.

To show the posterior inferior cerebellar arteries, the left anterior inferior cerebellar artery, and arteries to the supraolivary areas.

I found the anterior artery of the lateral parolivary fossa the artery most commonly present. Of 39 specimens that were considered sufficiently complete for the artery to be expected to be present, none lacked this artery on both sides, whilst four lacked it on one, the right side; of these four only two were exceptional, if we include as anterior arteries certain types with unusual origins which were not mentioned by Alexander and Suh (see later).

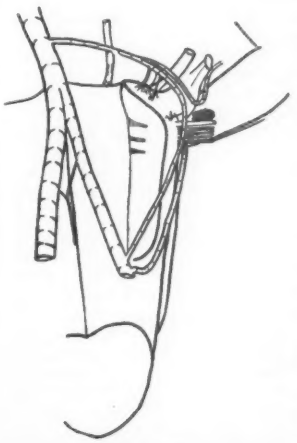

Figure III.

To show the left inferior cerebellar arteries, the left side anastomotic channel, and arteries to the left supraolivary area.

Of these 39 specimens eight had no direct branch from the basilar to the lateral parolivary fossa of either side, and on some the direct branch was lacking on one or other side. Notwithstanding this, the artery was so frequently present more than once on a side that of the 31 specimens involved there were 72 direct basilar branches (41 on the left, 31 on the right).

On a total of 32 specimens, 52 arteries, either anterior inferior cerebellar or internal auditory, gave at least one branch to the ipsilateral lateral parolivary fossa (Figure II, both sides of specimen; Figure III, right side; Figure VIII, left side). The fossa was so supplied 26 times on the left and 26 times on the right.

Considering the above two types as comprising the group of arteries called "anterior" by Alexander and Suh, I found 67 left and 57 right (124 left and right) branches of the basilar artery of this type supplying the lateral parolivary fossæ of a maximum of 39 specimens (78 sides); this demonstrates the fact that many lateral parolivary fossæ received blood through more than one branch of the basilar artery.

Certain atypical branches of types not described by Alexander and Suh passed from the basilar artery to the lateral parolivary fossa. Branches were given to the fossa from three left side and four right side posterior inferior cerebellar arteries whose origins were from the basilar artery (Figure IV, left side of specimen; Figure VIII, right side). One transverse pontine branch (of the right side) sent a fine twig down to the fossa. A common inferior cerebellar trunk on the right of one specimen (which gave off the anterior and the posterior inferior cerebellar arteries) gave small branches to the ipsilateral fossa. Branches passed to the fossa from an anastomotic arch on the left side of two specimens and the right side of one specimen (Figures III and VIII, left side of specimen; Figure VIII, right side).

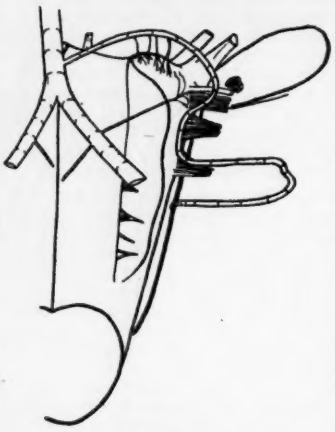

FIGURE IV.

To show the obliquity of the vertebral arteries, the left posterior inferior cerebellar artery, and arteries to the left supraolivary area.

The complete totals of branches of the basilar artery to the lateral parolivary fossa (including anastomotic channels between the basilar and vertebral arteries) were 72 for the left side, 64 for the right side (136 for left and right sides) on a maximum of 39 specimens.

The vertebral arteries of many of the specimens had been cut short close to their terminations in the basilar artery. Thus, a total of only 20 branches (six left side, 14 right side) passed directly from a vertebral artery to the ipsilateral fossa (Figure IV, left side of specimen; Figure V, right side). These 20 were observed on 14 specimens. The branch was present on both sides of occasional specimens, and even more rarely there were two arteries on one of the sides. Upper twigs of a lateral medullary branch of a vertebral artery supplied the lateral parolivary fossa on 15 left and 12 right sides, a total of 27 on 20 specimens (Figure II, left side of specimen). Alexander and Suh probably included both these groups in their "intermediate" type artery.

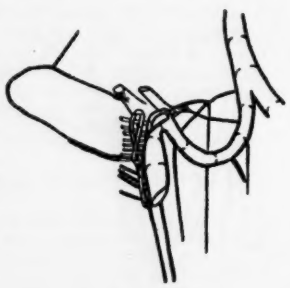

FIGURE V.

To show the course of the right vertebral and posterior inferior cerebellar arteries, and an artery to the right supraolivary area.

On 11 specimens, eight left side and five right side posterior inferior cerebellar arteries (with vertebral origins) gave branches to their ipsilateral lateral parolivary fossæ (Figure II, both sides). These branches have been named the posterior arteries.

A total of 29 (left) and 31 (right side) direct or indirect branches of vertebral arteries supplied the lateral parolivary fossæ of the specimens. Only a few specimens showed no branch of a vertebral artery going to the fossæ. The vertebral arteries of most of these specimens had been cut quite short with only one exception.

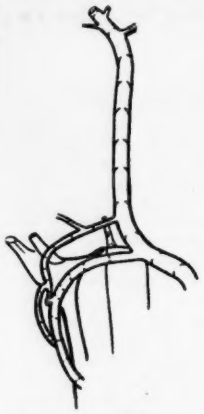

FIGURE VI.

To show the left vertebral, basilar, right posterior cerebral continuity of direction, the course of the right vertebral artery, and the right side anastomotic arch providing a double origin for the right posterior inferior cerebellar artery.

A few of the arteries of the fossa showed peculiar features. The direct branch of the basilar artery to the right fossa of one specimen anastomosed with a branch of the right vertebral artery. A small (left side) artery, which was a branch of the basilar artery and gave its branches to the flocculus and lateral parolivary fossa, effected a small anastomosis with a branch to the fossa from the left posterior inferior cerebellar artery. Branches of the basilar artery to the left sides of two specimens and the right side of another passing to the ipsilateral fossæ supplied also branches to the pons at the attachment of the facial nerve, the attachment of the auditory nerve and a branch to the auditory nerve respectively.

There is a tendency for the arteries of the brain stem to penetrate at fixed sites. The midline, particularly at the *foramen caecum* and the posterior perforated substance, is one such site to which large numbers of branches are drawn from arteries in the vicinity. On a smaller scale, the lateral parolivary fossa may be considered such a site.

Anastomotic Channels on Anterior Surface of Pons and Medulla.

Anomalous anastomoses on the anterior surface of the pons and medulla were present on several of the specimens examined.

Intervertebral Anastomosis.

FIGURE VII.

To show particularly the anastomotic channel between right and left vertebral arteries.

A short, wide anastomosis extended between the two vertebral arteries of one of the specimens at about the midolivary level. An anterior spinal artery arose at the back of the junction of the anastomotic and left vertebral arteries (Figure VII). Longo (1905) found that two specimens of the 50 he studied showed a transverse cross anastomosis between the two vertebral arteries, with the anterior spinal artery arising from the middle of the anastomosis. Blackburn (1907) found an intervertebral anastomosis in two of 220 specimens, and he observed that "occasionally" the anterior spinal artery arose from such a cross anastomosis. Schmeidel (1936) mentioned cases in which he found vertebral to vertebral anastomoses, some with the anterior spinal artery arising from the cross channel.

Vertebral to Basilar Anastomosis.

A second type of anastomosis, seven examples of which were found, provided a link ultimately between a vertebral artery and the basilar artery.

A small branch from the right vertebral artery of one specimen anastomosed with a small branch to the right lateral parolivary fossa from the lower part of the basilar artery. Another small anastomosis took place between

a branch of the left posterior inferior cerebellar artery to the left lateral parolivary-fossa, and a small branch from the lower part of the basilar artery to the left lateral parolivary fossa and flocculus.

The anastomosis took the form of providing a double origin for the posterior inferior cerebellar artery on the right sides of two specimens (Figure VI). On one of these specimens a superiorly directed branch from the upper root anastomosed through a small branch with the basilar artery.

One anterior inferior cerebellar artery (left side of specimen in Figure III) was provided with a double origin by an anomalous anastomosis with the left vertebral artery.

Both inferior cerebellar arteries on the left side of one specimen apparently shared a double origin from the basilar and left vertebral arteries (the presumed origin from the left vertebral artery was detached—Figure VIII).

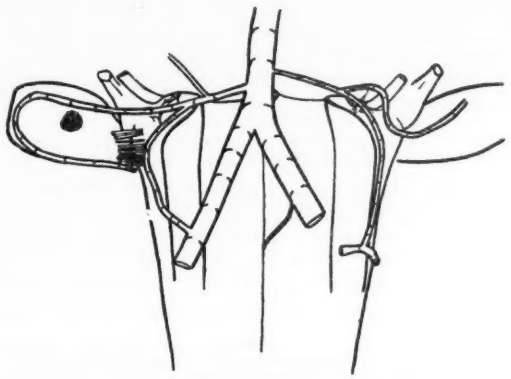

FIGURE VIII.

To show the course of the vertebral arteries and also anastomotic and inferior cerebellar arteries on both sides and the branches of these to the supraolivary area.

Tendency for Concurrence of Anomalous Anastomoses and Asymmetry of Artery Size.

Anomalous anastomoses were seen on six specimens. The arteries of the vertebral or posterior cerebral pair (or both pairs) were observed to be extremely unequal in size (by a factor of 2 or more) on 12 specimens. There were 32 specimens examinable in these respects. Four specimens showed both anomalous anastomoses and extreme inequalities of the above type. The 0·38 of specimens which showed extreme inequalities were 0·67 of the specimens showing anastomoses; the 0·19 of specimens showing anastomoses were 0·33 of the specimens showing gross inequalities.

A tendency for these two characteristics to occur together can therefore be postulated. Beddard (1904, 1905) concluded from his work on the comparative anatomy of the arteries of the brain stem that a completed circle of Willis seemed to be a secondary modification.

De Vriese (1904, 1905) studied the comparative anatomy, and the embryology, comparative and human, of the arteries of the brain. She found that in embryonic and post-embryonic development the origin of the posterior cerebral artery changed from the internal carotid to the basilar artery. She described the basilar artery as the primitive termination of the terminal caudal branches of the carotid arteries. The basilar arteries were primitively double, but in the course of evolution they became unpaired. The origin of the basilar artery was then taken over by the vertebral arteries, which were of secondary formation.

D. H. Padget, writing in Dandy's book (1944) on the embryology of these arteries, stated:

> There is a rather elaborate arterial branching and anastomosis in the region where the vertebrals join the basilar. This arrangement permits a wide variation in the origin of both inferior cerebellar arteries, and remnants of this lateral basilar-vertebral complex often persist in the adult.

The work of these authors is not sufficient to explain the occurrence together of the two types of anomaly. It need not be taken as far as this, because the finding was merely that there was a tendency for them to occur together on the one specimen. It does provide a rough morphological interpretation of this finding.

Correlation between Level of Commencement and Length of Basilar Artery.

The level of the termination of the basilar artery was found to be more constant than the level of its origin. A correlation is thus suggested between the level of commencement and the length of the basilar artery. The former consideration and the correlation if found would be evidence that the variations found in the level of commencement of the basilar artery were more than artifacts. The length of the basilar artery was not found to vary significantly with sex, but naturally a correlation would be expected between size of the brain and length of the artery. This latter type of variation in length could hypothetically be expected to be an analysable factor operating particularly in the smaller variations occurring about the modal value. The basilar artery was often slightly curved; the lengths measured were on the straightened artery. A positive correlation between shortness of the basilar artery and height of the basilar commencement was sought amongst the more extreme cases of the series, because amongst these it was hypothetically expected that the correlation would be less masked by the other factors considered above. Unfortunately, the use of extreme cases decreased the number of instances available for statistical examination.

TABLE I.

Level of Commencement in Relation to Lower Border of Pons. (Millimetres.)	Length of Basilar Artery. (Millimetres.)	Correlation.
Below—		
5·0	35	+
5·0	32	0
7·5	38	+
10·0	38	+
Above—		
5·0	30	0
5·0	27	+
3·0	25	+
3·0	28	0
2·5	25	+
2·5	27	+

A total of 37 specimens was studied, in respect to both the level of commencement and the length of the basilar artery. The basilar artery of five specimens was 4·0 millimetres (or more) longer than the mode (30 millimetres). The artery of eight was 3·0 millimetres (or more) shorter than the mode. The artery commenced 5·0 millimetres (or more) below the lower border of the pons in four cases, and 2·5 millimetres (or more) above this level in six.

Table I shows the length of those basilar arteries that commenced at exceptional levels (as described above). Of the 10 cases in this table, seven were of exceptional length. Thus these 10 out of the 37 specimens claimed seven out of the 13 exceptionally sized basilar arteries; that is, 0·27 of the basilar arteries commenced at exceptional levels, but these included 0·54 of the basilar arteries that were exceptional in length.

Table II shows the level of commencement of those basilar arteries that were exceptional in length. Thus 0·35 of the basilar arteries were exceptional in length. These comprised 0·7 of the basilar arteries that commenced at an exceptional level.

There are no cases in either table that have one factor abnormal and the other factor on the "wrong" side of its standard value.

Hasebe's Rule.

The basilar artery is usually described as extending from the lower to the upper border of the pons in the mid-line. The artery is, however, frequently displaced and convex to one or other side.

Authors differ in their descriptions of the arteries that are not in the mid-line, some finding the basilar more frequently convex to the left, others to the right.

Blackburn (1907) stated that the basilar artery was curved away from the side of an enlarged vertebral artery. Hasebe (1928) put forward a similar idea: that when the basilar artery was curved it was convex to the side of the smaller vertebral artery and when it was doubly curved the lower curvature was convex to the side of the smaller vertebral artery (Figure VI shows an example).

I found that the artery diverged to the left (or initially diverged to the left) 13 times, to the right 14 times. On 12 occasions the artery was judged to be in the mid-line.

TABLE II.

Length of Basilar Artery. (Millimetres.)	Level of Commencement of Basilar Artery.	Correlation.
25	Lower border of pons ..	0
25	2·5 millimetres above ..	+
25	3·0 millimetres above ..	+
26	Lower border of pons ..	0
26	Lower border of pons ..	0
26	2·0 millimetres above ..	0
27	5·0 millimetres above ..	+
27	2·5 millimetres above ..	+
34	Lower border of pons ..	0
35	5·0 millimetres below ..	+
35	2·5 millimetres below ..	0
38	7·5 millimetres below ..	+
38	10·0 millimetres below ..	+

Of the 13 specimens in which the basilar artery diverged to the left, the left vertebral artery was greater than the right in three instances, the right greater than the left in six. Of the 14 specimens in which the basilar artery diverged to the right, the left vertebral artery was greater than the right in eight instances and the right greater than the left in two. This substantiates the tendency Hasebe noted.

Summary.

1. The arteries of the pons and medulla of 42 specimens, some incomplete, were investigated.

2. The arterial supply of the lateral parolivary fossa was studied. (*a*) Branches passed to this fossa either directly from the vertebral artery or indirectly via the posterior inferior cerebellar or the lateral medullary arteries. (*b*) The fossa was almost constantly supplied by the basilar artery, either through a direct branch from the lower end of the artery or indirectly via the anterior inferior cerebellar or internal auditory arteries, or via posterior inferior cerebellar arteries of basilar origin; more rarely the fossa was supplied by branches of an anastomotic channel (vertebral-basilar type), a common inferior cerebellar trunk, or a transverse pontine artery to the trigeminal nerve attachment.

3. Two types of anomalous anastomosis were observed anterior to the pons and the medulla: (*a*) intervertebral and (*b*) vertebral to basilar. There is a tendency for these anomalous anastomoses to occur on those specimens showing gross asymmetries of calibre of either vertebral or posterior cerebral artery (or both).

4. The site of commencement of the basilar artery was more variable than the site of termination. A positive correlation was found between height of basilar commencement and shortness of basilar artery.

5. A tendency noted by Hasebe was confirmed, namely, that when the basilar artery deviates from the mid-line its convexity, or if doubly curved, the inferior convexity, tends to be directed to the side of the smaller vertebral artery.

Acknowledgements.

I am grateful to Professor A. N. Burkitt (Sydney), who placed the material at my disposal and who acted as guide, and to Professor S. Sunderland (Melbourne) for advice prior to publication.

I am also indebted to Miss H. Hunter for help in the bibliography and to Mr. S. Larnach, who photographed the drawings.

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Reports of Cases.

A RARE SEQUELA OF TYPHOID FEVER.

By E. H. STOKES,
Sydney.

IT is well known that typhoid bacilli may remain in the body for long periods of time after recovery from the initial infection. However, such cases are not common, but as they are obviously of great importance and interest it would appear that the history of a patient suffering from so-called metastatic abscesses caused by the bacilli many years after the original attack of typhoid fever should be recorded.

Clinical Record.

The patient, a male, aged forty years, by occupation a master plumber, was examined for the first time on March 1, 1940, in consultation with the late Dr. A. A. Paine, of Concord. He complained of pain in the left groin, which in the first place had occurred in September, 1939, following an attack of tonsillitis. A second bout of pain had been experienced in November and a third attack late in February, 1940. On inquiry into his previous health it was noted that he had suffered from typhoid fever in 1936.

On physical examination it was seen that the patient's general condition was excellent. There was no pyrexia, and the only abnormalities noted were limitation of movement of the femur at the left hip joint, tenderness on pressure over the left greater trochanter and small, unhealthy tonsils. An X-ray examination of the hip joints and the lumbar and sacral vertebræ revealed no abnormality.

On March 14, 1940, as he was still suffering from pain, he was admitted to Saint Luke's Hospital, Darlinghurst. The X-ray examination was repeated again with negative result. After a few days' observation it was noted that a mild degree of pyrexia (up to 100° F.) was present.

On March 21, 1940, a fluctuant mass about two inches in diameter inferior and medial to the left anterior superior iliac spine was palpated. Dr. W. Laurence Macdonald, who was called in consultation, advised that the patient be placed on a frame in order to immobilize the hip joints, and that the mass should be punctured with a needle. Thick pus was evacuated and submitted to Dr. C. H. Shearman and Dr. Eva Shipton for examination. They isolated typhoid bacilli on culture, agglutination and sugar tests giving positive results; but attempted culture of the urine yielded no growth of organisms. *Streptococcus viridans* was isolated in a swabbing from the tonsils.

On April 3, 1940, a course of sulphapyridine ("M. & B. 693") was commenced. This drug had no effect on the patient's condition, and on April 9 the temperature rose to 104° F. On April 11, 50 millilitres of thick pus were evacuated and the temperature fell to 100° F. The Widal test produced negative results against the strain of organisms isolated from the wound, Rawling's strain and a local strain of typhoid bacilli. The leucocytes numbered 5200 per cubic millimetre; 66% were neutrophile cells, 23% lymphocytes, 10% monocytes and 1% eosinophile cells. No typhoid bacilli were found in the fæces.

On April 13 the patient's temperature had fallen to normal. Thereafter the mass was punctured from time to time and varying quantities of pus were evacuated. On May 8, 550 millilitres of purulent blood-stained material were removed. On May 31, 300 millilitres of blood-stained fluid were evacuated, in which typhoid bacilli were found in pure culture. The amounts obtained became less, and on July 3 only 10 millilitres were evacuated. On July 8 another X-ray examination of the hip joints and lumbar and sacral vertebræ was made, but no bony lesion was seen. On July 24, however, 300 millilitres were removed. In spite of the removal of this large amount of fluid, pus collected again and an abscess pointed in the anterior aspect of the middle third of the left thigh, 220 millilitres of pus being aspirated on August 5.

The amounts removed thereafter diminished again, and on August 13, 130 millilitres of brownish fluid were evacuated, attempted culture of which was without result. On August 23, 100 millilitres were aspirated. On September 9, 60 millilitres of purulent fluid were removed, and the culture again yielded typhoid bacilli. Sulphapyridine was administered once more and a course of typhoid, paratyphoid A and B vaccine was given.

On September 16 the patient was allowed to walk, and on October 4 he left hospital. He was examined again on November 26, 1940. The thigh appeared normal, and after a holiday he resumed his usual occupation.

He remained well for six years, but on December 13, 1946, he was examined in consultation with Dr. T. O. R. Yates and Dr. A. C. Saunders because of recurrence of pain in the region of the left hip joint. Prior to the consultation he had been febrile, but the fever had subsided after courses of sulphamerazine and sulphadiazine.

On January 23, 1947, the Widal test produced a negative result and the leucocytes numbered 10,000 per cubic millimetre.

On March 7, 1947, a swelling was found in the middle third of the left thigh. Dr. F. C. Schwarz removed about 200 millilitres of reddish material, which was examined by Dr. Phyllis Anderson and on culture again yielded typhoid bacilli.

On April 24, 1947, an X-ray examination of the sacral region was made and it was reported that the left sacro-iliac synchondrosis was narrowed and partially obliterated, the appearance suggesting old arthritis of the joint.

As the mass in the thigh was increasing in size, it was incised by Dr. Schwarz on June 9 and again on June 27, 1947. The presence of a sinus tracking towards the ilium was noted by Dr. Schwarz. A solution of penicillin was applied to the cavity and a course of intramuscular injections of penicillin was given. A further incision was made about a month later and the abscess cavity gradually healed. The patient has been well now for about two and a half years.

Discussion.

It is difficult to decide the nidus in which the typhoid bacilli remained dormant after the initial attack of typhoid fever, but it is well known that osseous tissues are favoured by the organism. With regard to this point, Gay has made the following statement:

> One of the most frequent localizations of the typhoid bacillus, both during and after the disease, is in or about the bones. The organism is present in the bone marrow throughout the disease and characteristically localizes there in experimental animals.

In this case there was no X-ray evidence of osteomyelitis and no sequestrum was found. Nevertheless a minute sequestrum may have been removed with the dressings. The localization of the abscesses suggests that the ilium was probably the site in which the bacilli sheltered.

The negative Widal response in 1940 and again in 1947 is of importance as indicating a localized rather than a generalized infection. The absence of typhoid bacilli from the fæces and urine could be regarded as evidence against considering the patient a carrier. Further support for this statement arises from the fact that no cases of typhoid fever arose as a result of contact with the patient.

Although the patient is at present in good health, the occurrence of further abscesses is still possible, because cases have occurred twenty-three years after the original infection.

Summary.

A case of metastatic abscesses (probably originating in the ilium), occurring four and eleven years after an attack of typhoid fever, is reported.

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Reviews.

CLINICAL PATHOLOGY, APPLICATION AND INTERPRETATION.

"CLINICAL PATHOLOGY: APPLICATION AND INTERPRETATION", by Dr. Benjamin B. Wells, differs from most books with similar titles in that it is written, so to speak, from the other side of the looking-glass.[1] The author is professor of medicine at the University of Arkansas School of Medicine, Little Rock, Arkansas, and his book is addressed to physicians asking for laboratory tests to be made and not to clinical pathologists who perform them. As he states in his preface, "the clinical laboratory is a diagnostic instrument of established value, shared in varying degree and inflection by every branch and specialty of medicine". The aim of the book is to instruct the physician how to use the laboratory service efficiently and yet with wise restraint, so that neither the patient's time nor that of the pathologist may be wasted. Laboratory tests are becoming increasingly numerous and complex, and while experienced physicians can assess their true value, and fit them accurately into the mosaic of the patient's history and examination, younger doctors, and especially junior resident medical officers, often

[1] "Clinical Pathology: Application and Interpretation", by Benjamin B. Wells, M.D., Ph.D.; 1950. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 9" x 6", pp. 410, with a few illustrations. Price: 57s.

need enlightenment in these matters. As Wells writes: "The practitioner must know at least three things about every laboratory precedure he expects to use: (i) when to use it, (ii) how to interpret the results and (iii) what technical or physiological limitations must be taken into account in the interpretation."

The author has attempted to assemble and reorganize the common data of clinical pathology and to answer questions that confront physicians in the clinic and at the bedside. His material has accordingly been arranged exactly as the physician uses it. Beginning with a clinical situation, the applicable laboratory procedures are selected and their contributions to the problem are discussed. Headings of seven of the nine chapters which comprise the book are those which might be found in a text-book of medicine. These chapters deal with the application of clinical pathological methods to infectious diseases, diseases of the gastro-intestinal system, diseases of the kidney and urinary tract, diseases of the blood, diseases of the cardio-vascular system and metabolic and endocrine disorders. The eighth and ninth chapters discuss clinical laboratory studies in surgery and obstetrics respectively. An appendix, written with the assistance of Dr. A. E. Moon, deals principally with laboratory aids in the investigation of symptoms, when, as sometimes happens, these cannot be synthesized into a diagnosis.

A book of this kind is not likely to contain much that is new; it is a reorientation of clinical pathology from the physician's point of view. The book is readable and bespeaks good sense, wide experience and benignity on the part of the author. A certain amount of repetition is unavoidable, from the plan, but in many sections, the subject matter might have been dealt with more concisely. Sometimes the constructions are rather slipshod; for instance no university professor should write that "the urine is negative" (page 174). And surely the plural of "treponema" is "treponemata".

This book can be heartily recommended to resident medical officers and junior consultants in our hospitals.

ISOTOPIC TRACERS AND NUCLEAR RADIATIONS.

A NEW volume on the biological and medical applications of isotopes has been produced from the laboratories of the University of California—"Isotopic Tracers and Nuclear Radiations with Applications to Biology and Medicine".[1] The author is William E. Siri.

The first portion of the book is entirely physical and is a presentation of recent concepts of the nature and behaviour of the individual components of atomic structure, and it deals with the character and properties of nuclear radiations. Mathematical treatment is freely used and the text is illustrated by numerous tables, graphs and diagrams, for use by the physicist.

The next section describes apparatus and the instruments forming the armamentarium of the medico-physical laboratory. The mass spectroscope, Geiger-Müller tubes, ionization chambers and scaling units receive full physical discussion. Methods of standardization of radioactive samples and the mathematical theory of tracer methods are then dealt with. Questions concerning dosage units, physical methods of dosage measurement and calculations of dosage received by tissues following internal administration of radioactive isotopes are considered in a well-written chapter. The assay of tissue activity in representative biopsy material, and techniques for making tissue autoradiographs are considered in interesting fashion. A chapter on the safe handling of radioactive materials, in which particular reference is made to medical isotope usages, should be studied by all engaged in such work. The second section of the volume concludes with short descriptions of various types of supervoltage equipment.

Part three deals with the biological and medical applications of the isotopes. This section comprises approximately fifty pages only. The first chapter gives a critical presentation of the status of the new methods of radioactive tracer research in relation to the medical sciences. Up to 1947, 102 isotopes had been used in medical research, representing 60 of 96 known elements; however, over 700 radioactive isotopes are known and the author suggests that some 233 of these have properties suggesting biological usefulness.

In the succeeding chapters the author considers the major elements found in biological organic combinations, those constituting the chief minerals and the essential tracer elements. Each is briefly discussed and a summary is given of the newer knowledge concerning its metabolism and properties which has been gained by isotopic research procedures. These laboratory methods have also enabled study of elements, compounds, drugs and poisons which are normally foreign to the body, and much information has been gained, but the author clearly shows the potentialities of tracer methods in metabolic studies of seemingly unlimited range. The final chapter is a brief review of the therapeutic uses of the radioactive isotopes. It is too brief to be of great value. Tabulations are given of isotopes which have been used in medical tracer studies, and a further table lists other isotopes which have properties suggesting usefulness in medical or biological research.

A most comprehensive bibliography of nearly 100 pages follows; under the element concerned the literature published up to 1947 is listed.

The book will be of greatest use to the physicist engaged in medical problems, and for him many relevant physical data are assembled in the great number of tables which accompany the text, and for him mathematical treatment is used whenever possible. The volume, however, contains much that is of great value to the radiotherapist or to the physician using isotopes, and the chapters dealing with biological problems are commended to them. The chapter on the difficulties of formulating a satisfactory unit for internal dosimetry following internal administration of active isotopes is of particular interest. Each of the numerous units which have been proposed by various workers is described and criticized in an attempt to arrive at a satisfactory conclusion.

The sections of the book devoted to biological problems unfortunately seem small in proportion to the amount of pure physical material presented. But Siri and his collaborators have certainly done a fine work in collecting such a mass of material within a single volume, and the book will be a library necessity in any laboratory undertaking isotope work.

The review cannot be concluded without a word of praise for the printer. The book is lavishly interspersed with tables, diagrams, and many mathematical formulæ, which use type characters from many cases combined to form most complex typographical patterns. The art and craft of the printer have advanced just as surely as have the physical sciences recorded in this volume.

[1] "Isotopic Tracers and Nuclear Radiations: With Applications to Biology and Medicine", by William E. Siri; 1949. New York, Toronto and London: McGraw-Hill Book Company, Incorporated. 9" × 6", pp. 574, with 136 illustrations. Price: $12.50.

A TEXT-BOOK OF PATHOLOGY.

THE fifth edition of Beattie and Dickson's well-known "Textbook of Pathology" has been published in two volumes.[1] This division of the work makes for much more convenient handling once the reader remembers, after looking in the index, to turn to Volume I for all references before page 790. The high excellence of the text and illustrations of previous editions has been maintained in this. As in the fourth edition the editors have had the collaboration of Professor A. Murray Drennan. For those who are familiar with the previous editions it is necessary only to say that the fifth edition follows the lines of its predecessors with a revision of the text and illustrations to bring the work up to date. For those who have not used the book before a brief description of its scope and purpose may not be out of place. In their preface the authors state: "We have aimed at making our book a combination of 'textbook' and 'work of reference'." As far as it is possible to do this in 1440 pages with more than another 100 pages of indexes the authors have succeeded. This compression has been made possible by the use of extensive cross reference. The device of using small print for rarer conditions and less important pieces of information has also been used. This habit of authors using small type is always a source of annoyance to the older readers whose curiosity for the sort of information usually put in small type seems to increase with their presbyopia. The authors in this edition use the device of small type with commendable restraint. There is a wealth of information in the footnotes which one would have in small type rather than forgo.

[1] "A Textbook of Pathology, General and Special, for the Use of Students and Practitioners", by J. Martin Beattie, M.A. (New Zealand), M.D. (Edinburgh), D.Sc. (Hon. Causa), National University of Ireland, M.R.C.S., L.R.C.P. (London), and W. E. Carnegie Dickson, M.D., B.Sc., F.R.C.P. (Edinburgh), with the collaboration of A. Murray Drennan, M.D., F.R.C.P. (Edinburgh), F.R.S.E., edited by W. E. Carnegie Dickson; Fifth Edition; in two volumes; 1948. London: William Heinemann (Medical Books), Limited. 9¾" × 6¼", pp. 1612, with 801 illustrations and 21 coloured plates. Price: £8 8s.

The general plan of the book is first to describe pathological processes in general and then to deal with various anatomical systems in particular. Thus fifteen chapters occupying 504 pages suffice to deal with such general topics as inflammation and repair, bacterial and virus infections, disturbances of circulation, hyperplasia, neoplasia and vitamin deficiencies, to mention the subjects of but a few of the early chapters. The rest of the book consists of 15 chapters on such subjects as diseases of the circulatory system, diseases of the alimentary canal, disorders of the blood and diseases of the blood-forming organs, diseases of the ductless glands, again to mention but a few. By far the longest of these chapters is that on diseases of the nervous system, which deals admirably with a difficult subject.

The book is not a reference book for the working histopathologist requiring detailed descriptions of all the possible microscopic variations in the slides upon which he is expected to make a diagnosis. Such a person must inevitably use monographs. No attempt is made in this work to cover the pathology of the specialities of dermatology, oto-rhino-laryngology or ophthalmology as such. Where diseases of these organs occur in general diseases or pathological processes in general the account of them is adequate.

This work will be found to fulfil adequately the authors' aims of a "textbook" and "work of reference", as users of previous editions would expect.

PHYSIOLOGY IN DISEASES OF THE HEART AND LUNGS.

ONE of the pressing problems for all clinicians is the difficulty in keeping abreast of advances in physiology, and coincident with this, the necessity for critical comparison of conflicting experimental evidence entails additional time and thought. It is therefore very refreshing and gratifying to be able to read a concise, critical and clear account of "Physiology in Diseases of the Heart and Lungs" written by M. D. Altschule.[1]

This handy volume was written, according to the author, at the request of third and fourth year students at the Harvard Medical School and it should achieve its object of facilitating the approach of students to their clinical work. Not only will it be found to be of great assistance to such students, but it will be welcomed by physicians and, more especially, by teachers of medicine. The work presents a review of data from innumerable scientific papers and these are assembled according to their importance in the discussion of physiological aspects of disease rather than in the concept of the original author. However, much is gained by this approach, and in every instance full reference is given to the original papers from which data are extracted.

Physiological aspects of chronic cardiac decompensation are discussed in 37 subsections ranging from cardiac output, circulation time, arterial and venous pressures and respiratory dynamics to œdema, cyanosis, dyspnœa, the effects of therapy and the pathogenesis of signs and symptoms of cardiac failure. Other chapters cover acute pulmonary œdema and cardiac asthma, *angina pectoris* and myocardial infarction, cardiac arrhythmias, pericarditis and congenital and acquired cardiac defects. Pulmonary fibrosis, emphysema, asthma, pleural effusion, pneumothorax and pneumonia are discussed.

The monograph is a delight to read and the bibliography is so full that students and practitioners alike will welcome it. Clinical teachers will find it to be a boon.

A SYNOPSIS OF INTERNAL MEDICINE.

IN presenting his book "Fundamentals of Internal Medicine",[2] the author, W. M. Yater, sets out "to make readily available for student and practitioner the essentials of the vast subject of internal medicine". The book is, in fact, a synopsis of medicine presented in a quickly readable form; the more important facts are picked out from the general body of the text by heavier type, while many subjects are rounded off by a brief summary of the main points. This style of presentation is, no doubt, intended to assist memorization, but is not what one would have expected from the title.

For the student this book is too much a maze of facts, and too little a building on the foundations of pathology and physiology of a structure of logical deduction and diagnosis and rational therapy. This must surely be the aim of teaching, rather than to encourage the assimilation of a mass of empirical and sometimes disconnected facts. The book may be more useful for reference by the busy practitioner; and yet he would be annoyed on referring (for example) to subacute bacterial endocarditis, to find a description of the disease on pages 40 to 46 and the treatment on page 133, at the end of the section on heart disease. The use of the metric system, exclusively, in stating dosage will make the book less popular in this country.

At the end of the book are excellent sections on dietetics, chemotherapy and inhalational therapy, where much useful and practical information is readily available for reference. The section on electrocardiograhy is simple and clear, and the subject is dealt with from the underlying physical basis, rather than being presented as a number of empirical observations. This section, however, occupies half the space allotted to heart disease, which seems disproportionate, interesting and instructive though it is.

The style is brief, so that the description of some of the rarer diseases contains such scanty information that little is added by their mention. The brevity leads sometimes to misleading statements such as that amœbic abscess of the liver "occurs in those who have manifested evidence of amœbic dysentery". Surely it is more important to point out that the condition frequently occurs in those who have never manifested dysenteric symptoms. Again a statement such as "serious complications rarely occur from pneumothorax therapy" in pulmonary tuberculosis requires qualification. On the other hand a suggestion that pneumothorax or phrenic paralysis is sometimes useful in the treatment of lung abscess must be condemned.

The book is well produced and is freely illustrated. The illustrations on the whole are of high standard, although some of the reproductions of radiographs lack definition and clarity. The book contains a mass of useful information, but as a standard text-book it cannot be recommended to replace those at present in use in the medical schools of this country.

FOSSIL MAN.

DR. R. BROOM has written a most attractive and interesting account of recent findings of the fossil bones of man-apes.[1] He begins with a short account of the discovery of Pekin man described by Davidson, Black and Weidenreich and the more recently discovered giant ape-men, such as Gigantopithecus and Meganthropus, described by the German anthropologist von Koenigswald and also by Weidenreich. He then passes to African finds, to which he himself has contributed, in conjunction with Professor Dart, of Johannesburg, and Leakey, of Nairobi.

The first find was that of the Taungs skull, that of a young humanoid ape with the milk dentition and first permanent molars intact, described by Dart as far back as 1925. Broom outlines the chequered history of this earliest find of the man-apes of South Africa or Australopithecinæ, as Dart named them.

For a long time many scientists refused to accept Dart's deductions. Among the many interesting conclusions as to these ape-men, is one that they lived under desert conditions in caves and not in forest or jungle country. Another deduction is that they were carnivorous and cannibals and hunted, probably in packs, catching even young antelopes, as well as digging out giant moles. They also hunted and caught baboons, and in many of the baboon skulls there is evidence that the killing weapon used was a large femur.

Broom then gives a fascinating and racy account of the more recent finds of adult Australopithecinæ at Sterkfontein, Kromdraai and the Makapan caves, especially in 1947, 1948 and 1949. These finds include upper and lower jaws, teeth, a hip bone, and even recently a thumb metacarpal bone.

The total body of evidence is now very impressive and incidentally weighs many tons.

From all these finds it is concluded that the South African man-apes walked upright, and had an almost human thumb;

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[1] "Physiology in Diseases of the Heart and Lungs", by M. D. Altschule; 1949. London: Oxford University Press. 8¼" × 5¼", pp. 388. Price: $5.00.

[2] "Fundamentals of Internal Medicine", by Wallace Mason Yater, A.B., M.D., M.S. (in Med.), F.A.C.P.; Third Edition; 1949. New York: Appleton-Century-Crofts, Incorporated. 9¼" × 6¼", pp. 315. Price: $12.00.

[1] "Finding the Missing Link", by R. Broom, D.Sc., LL.D., F.R.S., F.R.S.E.; 1950. London: Watts and Company. 7½" × 5¼", pp. 118, with nine illustrations. Price: 6s.

they also had teeth closely resembling human teeth and did not have large interlocking canines. Again, their skull was carried more erect than that of the giant apes, though the brain size was still relatively small, for example, 600 to 700 cubic centimetres. The occipital condyles were placed well forward.

As mentioned above there is abundant evidence that they were hunters and used tools and weapons such as antelope horns, femora and ungulate mandibles, the teeth of the latter being used as scrapers, and also one form which Dart called *Australopithecus prometheus*, probably used fire.

Broom's concluding chapters are on "Man's Place among the Primates" and on "Man's Evolution". Here he may be somewhat heterodox; nevertheless he is stimulating and certainly entitled to views based on a life-long study of many and varied aspects of vertebrate evolution.

We can thoroughly recommend this book for those who wish to know the main facts about recent finds of fossil man and his immediate ancestors, described in a popular, accurate and readable manner.

DIAGNOSTIC RADIOLOGY.

A WORK entitled "Diagnostic Radiology" by the late G. Claessen (Iceland) is a translation from the Danish edition published by Munksgaard, of Copenhagen.[1] It is a small work intended for the student and general practitioner rather than for the advanced radiologist. The translation is rather too literal and is sometimes difficult to read. The illustrations are of excellent quality and illustrate well the various conditions described in the text. The description of bone diseases and tumours is rather sketchy and rather too condensed. The section on radiology of the accessory sinuses is dealt with very well and the illustrations bear clear descriptive captions. A small section on cerebral arteriography is included and the author points out that the brain does not tolerate salt solutions such as "Abrodil" (which may be used in arteriography of the extremities). "Diodrast" is recommended in these examinations as it does not produce any irritation. Chest conditions are very clearly dealt with in a small space. The author, an authority on hydatid disease, does not enlarge on this condition. He describes an interesting case of hydatid disease of the left ventricle and also a case of extensive calcification of the pericardium. Altogether this is a good contribution to radiology and is well worth inclusion in the radiologists' library.

FOOD BIOCHEMISTRY.

IN their "Elements of Food Biochemistry" Professor Peterson and his co-authors have set themselves a very difficult task.[2] They have attempted to deal, in less than three hundred pages, with the chemistry, digestion and metabolism of the principal classes of food constituents, including minerals and vitamins. In addition space is taken for the inclusion of review questions and references, as well as illustrations, mainly of crystals of amino acids, vitamins and enzymes. Apart from the fact that some of the illustrations are not well reproduced, their value is doubtful.

The book is based on material used in teaching in the senior author's department of biochemistry in the University of Wisconsin. Under the conditions under which this material is used, probably as a guide to further exposition, it doubtless serves a useful purpose. Of itself, however, the book would not seem to be helpful to the junior student, nor full enough for the more senior student. The most valuable part of the book is the series of four extensive tables on the composition of foods. The tables on the mineral and vitamin content of some foods contain data which have been obtained in the senior author's laboratory. These are not yet readily available elsewhere. These contributions come from a centre which is widely known for its work on certain aspects of nutrition. The addition of an index would increase the usefulness of the book.

[1] "Diagnostic Radiology: For Practitioners and Students", by G. Claessen, M.D., with a foreword by J. W. McLaren, M.A., M.R.C.S., L.R.C.P., D.M.R.E.; 1950. London: William Heinemann (Medical Books), Limited. 9¼" × 6¼", pp. 412, with 396 illustrations. Price: 60s.

[2] "Elements of Food Biochemistry", by William H. Peterson, Ph.D., John T. Skinner, Ph.D., and Frank M. Strong, Ph.D.; 1949. London: Staples Press, Limited. New York: Staples Press, Incorporated. 8¼" × 5¼", pp. 276, with 32 illustrations. Price: 21s.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Anxiety in Pregnancy and Childbirth", by Henriette R. Klein, M.D., Howard W. Potter, M.D., and Ruth B. Dyk, M.S.; 1950. New York: Paul B. Hoeber, Incorporated. 9¼" × 6", pp. 124. Price: $2.75.

This is a "Psychosomatic Medicine Monograph" published under the sponsorship of the American Psychosomatic Society.

"The Medical Clinics of North America" (issued every two months); 1950. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. New York Number. 9" × 5¾", pp. 336, with 61 illustrations. Price: £7 5s. *per annum* (cloth binding) and £6 *per annum* (paper binding).

Comprises a symposium on cardio-vascular diseases discussed in twenty-five chapters.

"Researches on the Measurement of Human Performance", by N. H. Mackworth; 1950. Medical Research Council of the Privy Council, Special Report Series Number 268. London: His Majesty's Stationery Office. 9¼" × 6", pp. 156, with many illustrations. Price: 4s. net.

Deals with vigilance tests and environmental stress tests.

"Disorders of the Blood: Diagnosis, Pathology, Treatment, Technique", by Sir Lionel E. H. Whitby, C.V.O., M.C., M.A., M.D. (Cantab.), F.R.C.P. (Lond.), D.P.H., and C. J. C. Britton, M.D. (New Zealand), D.P.H.; Sixth Edition; 1950. London: J. and A. Churchill, Limited. 9¼" × 6", pp. 782, with 106 illustrations, 12 of them in colour. Price: 42s.

The fifth edition has been extensively revised.

"The Principles of Anatomy: An Introduction to Human Biology", by A. A. Abbie, M.D., B.S. (Syd.), D.Sc. (Syd. and Adel.), Ph.D. (Lond.); Third (Revised) Edition; 1950. Sydney, London: Angus and Robertson. 8¼" × 5¼", pp. 312, with many illustrations. Price: 25s.

A somewhat expanded version of the volume first published in 1940.

"Recent Advances in Pharmacology", by J. M. Robson, M.D., D.Sc., F.R.S.E., and C. A. Keele, M.D., F.R.C.P.; 1950. London: J. and A. Churchill, Limited. 8" × 5¼", pp. 430, with 46 illustrations. Price: 24s.

Intended as a survey of some recent developments in pharmacology likely to be of interest to students and practitioners of medicine.

"A Pocket Obstetrics", by Arthur C. H. Bell, M.B., B.S., F.R.C.S., F.R.C.O.G., Hon. M.M.S.A.; Second Edition; 1950. London: J. and A. Churchill, Limited. 7¼" × 4¾", pp. 164, with 14 illustrations. Price: 7s. 6d.

An attempt to present the "fundamental lines of approach" to the practice of obstetrics.

"Males and Females", by Roger Pilkington; 1948. London: Delisle. 8" × 5¼", pp. 92, with many illustrations. Price: 9s. 6d.

On human heredity and written in an attractive and popular form.

"Change of Life: Facts and Fallacies of Middle Age", by "Medica"; 1948. London: Delisle. 8¼" × 5¼", pp. 84. Price: 7s. 6d.

"Medica" is the *nom de plume* of a "distinguished medical consultant".

"Modern Contraception: A Practical Guide to Scientific Birth Control", by Philip M. Bloom; 1949. London: Delisle. 6¼" × 4", pp. 54, with illustrations. Price: 3s. net.

Describes the several methods and gives some sound advice.

The Medical Journal of Australia

SATURDAY, SEPTEMBER 9, 1950.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: surname of author, initials of author, year, full title of article, name of journal without abbreviation, volume, number of first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

AUTHORITY IN MEDICINE.

A WRITER in *The Times Literary Supplement* has stated recently that of all hypnotic phrases none is more effective than "on good authority" and that reputations are exalted or ruined by it and history is falsely written. In medical writings "authorities" are so often quoted and used in support of certain opinions that it may be well to inquire whether we are not all at some time or other taken as suitable subjects for hypnosis and whether we do not sometimes allow ourselves to be hypnotized. Indeed, we may on occasion, not perhaps with evil intent, assume the role of hypnotist. If we look for the meaning of the word "authority" in the Oxford Dictionary we find that the definitions are divided into two groups, one to do with "power to enforce obedience" and the other with "power to influence action, opinion or belief". In the second category one of the definitions has two groupings: "a person whose opinion or testimony is accepted", and "one whose opinion on or upon a subject is entitled to be accepted". The distinction here is important. A medical writer or investigator may be said to enjoy authority because his fellows acknowledge his eminence, having discerned the depth of his knowledge and the wisdom of his interpretations. On the other hand authority may be assumed under a camouflage of many words, spoken or written, not once nor twice, but on many and enduring occasions—the words are full rather of "sound and fury" than of "wise saws and modern instances", but they beguile the unwary. Of course, the title of authority may be given unsought to the verbose by their unwary neighbours. Let us therefore look at authority in medicine from the subjective and objective points of view.

The acknowledged authority in medicine, the man who is said to enjoy authority by the common consent of those among whom he works, has attained a position which is most to be desired and which must give him the greatest satisfaction. To attain such a position is a laudable ambition. Its attainment has nothing to do with professional income or social standing. It is not dependent on likeable qualities or personal charm. One can imagine a recognized authority who is a boorish and unpleasant person. Such an individual would, of course, not be nearly so objectionable as a boorish pretender to the ranks of authority. There is no reason why every medical practitioner should not become an authority on some subject or other. At the same time it would be well to remember that the process of knowing more and more about less and less may be carried so far that profound knowledge of one subject may be accompanied by ignorance of every other. And here it may be stated that the essential qualifications for recognition as an authority are, as already implied, knowledge and wisdom in its interpretation. We might perhaps add to this wisdom in its application, though that would not always be a necessary attribute—the purely academic authority may have an understanding of what he knows and yet be unable to apply it to practical affairs. A man known to be an authority may be boorish and unpleasant or he may be courteous and anything but self-assertive. Like anyone else, he may have qualities which would be placed in the range anywhere between these extremes. To be acceptable to the people among whom he works he should have a generous mind. What is known as priority in medical investigation and writing is admittedly important and the first person to make a discovery or to find the solution to a problem should receive credit, but the desire to secure priority may be overdone. This sometimes happens when there are several members of a team. The head of the team, A, will see that the priority suits his programme, and the others, B, C and D, do not receive the fair and square treatment that is their due. They tend to become "*et alii*" or are lumped together as "his co-workers", or "the members of the team", although they may have taken a far from subsidiary part in the investigations. We may thus conclude that, though an "authority" attains his title by reason of knowledge and understanding, he should also be judged by his other qualities, chief of which is generosity of mind.

From the purely objective point of view it is important that all who run in the race of medical endeavour should be able to recognize authority. There are probably still some people who accept the truth of a statement because they see it somewhere in print—in a book or periodical—and no doubt medicine produces some of them. Even the very elect may sometimes be deceived, as we are told that they may be in other situations. Statements that deceive are sometimes those taken from their context and quoted in support of a specific intention. The reader has to distinguish between what is authoritative and what is not. We see in the advertising pages of medical journals how necessary it is that this should be done. An isolated statement is sometimes taken from the article of an author who may not be widely known, and applied to some therapeutic substance or to a particular apparatus, to promote its sale. Even the advertiser may be mistaken, and of course his error is the more easily made because he believes his medicament or appliance to be good. As a matter of fact the American Medical Association takes such a serious view of the lifting of quotations from its publications by advertisers that it has recently reminded them that quotations from the Association's publications may be used only with express permission in each instance. But this is rather incidental to our discussion. The point is that false authorities may, like false gods, be set up and someone will almost certainly be found

to fall down in worship. There may be recalled the remark of Claudio in "Much Ado About Nothing", though in regard to matters personal rather than medical:

> O, what authority and show of truth
> Can cunning sin cover itself withal!

At the outset of this discussion the hypnotic state was mentioned. People who submit to hypnosis put themselves in the hands of the hypnotist and do what he suggests that they shall do. In anything to do with authority in medicine we should spurn all that is redolent of hypnosis and rather use our intelligence and accept the authority after our own critical examination of his dicta. In that way each of us will, to some extent at least, become his own authority.

Current Comment.

MODERN TRENDS IN CÆSAREAN SECTION.

A PERUSAL of current and recent journals indicates that the proportion of deliveries effected by Cæsarean section is a good deal greater overseas, especially in the United States, than it is in this country, and that it is increasing. In many large series of cases the Cæsarean section rate is between 3% and 6% of all deliveries, in a few instances it is higher, but in practically none is it as low as the 2% recorded at the Women's Hospital, Crown Street, Sydney, for the period July, 1948, to June, 1949, or the 2·6% recently quoted for the Women's Hospital, both in Melbourne and in Brisbane. This trend of substituting Cæsarean section for "the more formidable, traumatizing vaginal delivery" is regarded by D. Anthony D'Esopo[1] as indicating one of the most important changes taking place in obstetric practice, and he produces some interesting points from a review of Cæsarean sections performed at the Sloane Hospital for Women, New York, from 1942 to 1947. Obviously, he points out, this change is being effected only in proportion to the increasing safety of the operation, and recently with the advent of positive and efficient means of treating infection and shock, the mortality rate has been materially lowered. In the period of review 1266 Cæsarean sections were performed with only one death, and that in no way related to the operation. The Cæsarean section rate amongst public hospital patients was 4·47% as against 7·72% amongst private patients. It appears that a considerably greater number of operations is being carried out in the interests of the child or to avoid even minor risks to the child. At the Sloane Hospital in 1920 the mid-forceps operation rate was approximately 6% and the Cæsarean section rate slightly over 3%; in 1947 the positions were reversed with the mid-forceps operation rate slightly over 1% and the Cæsarean section rate 6%. Parallel to the falling incidence of mid-forceps operations, the autopsy records reveal a decrease of fœtal birth injuries from 20% in 1932 to 2% in 1947. In addition, maternal pelvic injury has become negligible. If the trend continues, D'Esopo points out, the mid-forceps operation could theoretically disappear with a Cæsarean section incidence of 6·5%. As a working formula for an obstetric service that deals with an abnormal selected group, a Cæsarean section rate of between 5% and 6% is suggested with a maternal mortality of 0·1% and a preventible term fœtal loss of 1%. The main indications for Cæsarean section in the series reviewed were cephalo-pelvic disproportion (53·9%), previous Cæsarean section (12·1%) and *placenta prævia* (7·6%); 69% of patients with *placenta prævia* underwent Cæsarean section, as against 20% fifteen years earlier. Other indications were uterine inertia and cervical dystocia (7·1%), pre-eclampsia (2·7%), malpresentation (2·4%) and accidental hæmorrhage (1·8%). The gross fœtal mortality rate of 3·7% compares favourably with that of 3·3% associated with vaginal deliveries for the same period, especially as the cause of most deaths was inherent in the maternal complication for which the operation was performed. No maternal deaths occurred. The lower segment operation was performed in 487 cases, the classical in 456, Cæsarean hysterectomy in 54 (50 being elective), and extraperitoneal section in three (none within the last five years). D'Esopo feels that the lower segment operation, with antibiotic therapy before and after operation, is a safe procedure where there is potential infection. With prophylactic antibiotic therapy trial of labour may be extended to twenty-four hours when reasonable doubt exists of need for operation.

At the Women's Clinic of the New York Hospital, according to R. G. Douglas and R. Landesman,[1] the incidence of Cæsarean section has increased from 2% to 4% during the years from 1933 to 1947. The lower segment operation has gradually replaced the classical and extraperitoneal procedures. During the past eight years no maternal deaths from infection have occurred; between January, 1946, and June, 1948, of 419 consecutive Cæsarean sections 70 followed twenty-four hours of labour, but no serious infections were encountered. Douglas and Landesman feel that the use of modern surgical supportive therapy has practically removed the need for extraperitoneal or radical Cæsarean section in favour of the lower segment operation. When gross negligence results in uncontrollable intrapartum infection, extraperitoneal section or Cæsarean hysterectomy may be indicated, but they have observed no patients in this category of recent years.

L. H. Verch, J. G. Stouffer and R. S. Cron[2] present a variant of this picture, for the incidence of Cæsarean sections at the Milwaukee Hospital has dropped from 7·4% in the period 1933-1937 to 5·4% in the period 1943-1947. Just the same they consider an incidence of from 5% to 5·5% the irreducible minimum with their present indications, so their figures still do not in practice conflict with current trends. Over the period 1933-1947 their maternal mortality rate was 0·81% in 1231 consecutive Cæsarean sections; no maternal deaths occurred in the last five-year period when about half the operations were performed. The lower segment operation steadily supplanted other techniques, 92% of operations being of this type in the last five-year period; extraperitoneal section was not performed.

In a discussion which followed the presentation of the papers of D'Esopo and of Douglas and Landesman at a meeting of the New York Obstetrical Society, certain main views came to light. General approval was expressed at the increasing incidence of Cæsarean section. With the exception of S. A. Cosgrove, of the Margaret Hague Maternity Hospital, who displayed enthusiasm for the extraperitoneal operation, speakers favoured the lower segment procedure. A certain caution was coupled with general appreciation of the gratifying results obtained with the use of chemotherapy and antibiotics. This attitude of caution is supported in a report by W. J. Dieckmann and A. G. Seski[3] of 2871 Cæsarean sections performed at the Chicago Lying-In Hospital between 1931 and 1949. Their Cæsarean section rate has varied little over that period (ranging between 5% and 5·6%). Their maternal mortality rate was 0·42%; 12 deaths occurred, of which only two were in the period 1942-1949, and those both from pulmonary embolism; the last death from sepsis was in 1937. They do not, however, attribute their low mortality rate to the use of sulphonamides and antibiotics; these are used, but only as an aid to "the time-proved measures of proper uterine drainage, uterine tone, blood transfusions, parenteral fluids, and the elimination of 'meddlesome' obstetrics". In borderline cases, they insist on a decision at the end of twenty-four hours whether the patient is to be delivered by laparotrachelotomy

[1] *American Journal of Obstetrics and Gynecology*, January, 1950.

[1] *Ibidem.*

[2] *Ibidem.*

[3] *Surgery, Gynecology and Obstetrics*, April, 1590.

or by the vaginal route, or, if the patient shows evidence of uterine infection and the baby is undamaged, by Cæsarean hysterectomy. The lower segment operation is favoured for Cæsarean section, but antibacterial drugs are not as a rule used, and the emphasis in the presence of infection with an undamaged baby is on hysterectomy. In view of the results reported by others, Dieckmann and Seski state that they also will use antibacterial drugs for patients with prolonged rupture of membranes or prolonged labour, and will slowly increase the duration of labour in presumably "clean cases"; but they believe that these practices should be limited to large clinic services until more experience has been gained. They properly stress the importance of maintaining aseptic technique in Cæsarean section and of never using the operation as a last resort.

To these studies with their fairly obvious implications may be added a few of the points made by E. L. Cornell[1] in a brief and lucid article on the indications for Cæsarean section. He emphasizes the importance of handling primiparous patients under the age of thirty-five years differently from those over thirty-five years; the latter have much less chance of having another baby, and with them fewer risks should be taken in attempting vaginal delivery. He lists the following indications for Cæsarean section: cephalo-pelvic disproportion; bleeding as a result of placental abnormalities, in most cases; premature separation of the placenta, in all cases as soon as the diagnosis is made; *placenta prævia*; difficult labour ("successful" vaginal delivery in which the mother is exhausted, the vagina "torn to shreds" and the baby probably damaged is regarded as bad obstetrics); toxæmia of *primipara* in many, but not all, cases; heart disease if decompensation is feared; certain cases of the "dystrophia dystocia" syndrome described by DeLee, in which often the membranes rupture but labour pains are absent, the cases being those in which the patient complains bitterly of backache out of all proportion to the quality of the uterine contraction. Cornell discusses with some care the management of the last-mentioned group, which requires keen judgement and long experience. Special notice may well be taken of his warning that the use of sulphonamides and/or penicillin or other antibiotics does not provide absolute protection against infection; he quotes his salutary experience in this direction. Cornell's summing up is simple but practical. The question of when to perform Cæsarean section, he states, resolves itself in a complete examination of the patient before and during labour, with an open mind. He admits that a few extra Cæsarean sections may be performed that should not be, but in his view the results in the lowering of the fœtal and maternal mortality justify the procedure. Finally, he asks whether we should limit the use of Cæsarean section to favour the statisticians against the lower fœtal and maternal mortality, to say nothing of the maternal damage and morbidity. This is surely a rhetorical question, providing an Irishman's answer to those who ask if the Cæsarean section rate is not rising too high.

To balance all this enthusiasm for more Cæsarean sections it may be as well to quote the comments of a well-known obstetrician and gynæcologist, J. P. Greenhill. His comment is almost trite, but it shares its type of triteness with many other important statements that, seemingly obvious, need to be made again and again. In an editorial note in "The 1949 Year Book of Obstetrics and Gynecology", he writes:

> Despite the fact that in many large clinics the death rate for clean elective cesarean sections is almost negligible, the operation should not be undertaken lightly. Although frequently the indication for cesarean section is the desire to secure a live baby, a disproportionately large number of babies are born dead or die shortly after cesarean section. Likewise, despite improved technic, improvements in methods and procedures of anesthesia and the use of antibiotics, women will continue to die from cesarean seciton.

[1] *Surgical Clinics of North America*, February, 1950.

ESSENTIAL HYPERTENSION AND LOW-PROTEIN DIET.

THE conditions of war have imposed dietary stringency on whole populations, and usually with unfavourable effects upon their nutrition. Sometimes, however, restrictions have had some compensatory value, as in the many diabetics in central Europe during the 1914-1918 war, who benefited to some extent from the enforced lowering of their caloric intake. A study was made during the last war by Joseph Kohári-Kuchárik of the effects of a complete protein famine in Budapest following the siege of the city.[1] He was working then in the Department of Medicine in the University of Budapest, and is now in London. In seizing the opportunity to observe the influence of deprivation of protein on the subjects of essential hypertension, he was encouraged by the fact that the literature on the subject is rather confusing. He quotes the findings of Saile, who compared the blood pressures of the members of two religious orders and found that in similar age groups systolic pressures were higher by 30 to 40 millimetres of mercury in those who were meat eaters and not vegetarians by regulation. Other experimental observations on human subjects taking diets varying in protein content have been contradictory. The more recent use of rice in hypertension, with a minimal amount of animal protein, will also be remembered. Kohári-Kuchárik's study was carried out in 1945 when no animal protein was available to the inhabitants of Budapest. He used the out-patients of the medical department for his tests. These patients had been attending for treatment for two to five years, and many of them were under frequent observation. The original group consisted of 150 patients, but the rigours of the local conditions reduced them to 39, and these were observed from January, 1945, for about ten months. When the actual siege began in December, 1944, the stocks of tinned meat in Hungary were negligible. Carbohydrates were available, though limited in amount and poor in quality, chiefly maize flour. Dairy foods were unobtainable, and there were no cattle or poultry. Relief came only when the harvest of 1945 replenished food stocks; other sources of food, in particular animal protein, were restricted to occasional gifts from relatives in the rural districts and from the Red Cross. The author states that the maximal intake of protein by his patients could not have exceeded 20 to 30 grammes daily, and this only for a few days. Before we turn to the results, it is interesting to note the factors which produced the peculiar dietary position. The retreating German army took most of the country's livestock with them, a great proportion having already been destroyed by the depredations and neglect of war, and all rail and motor traffic was interrupted owing to destruction and commandeering by the Nazis. In addition, currency problems caused such a degree of inflation that farmers consumed their limited stocks instead of sending them to market. These factors, and the dangers of war, might have been expected to cause some psychological unrest, but the author points out that these could not have affected the blood pressure of his group adversely, because, though the food position had deteriorated, the hazards of air raids and of the coming siege had disappeared during the latter part of the investigation. Had any psychosomatic change taken place it would more probably have been favourable in nature. In an analysis of the records no substantial change is apparent during the test period. The average of the blood pressure changes in the systolic reading is a rise of only 4·6 millimetres of mercury. The ages of patients are found to be mostly in the sixty to seventy years group, but no record of the body weight is given. Perhaps it is fair to assume that the element of spasm—that is, the more remediable part of the pathogenesis—is small in this series.

This set of observations is a rather novel contribution to the already swollen literature of hypertension. At least it supports the common-sense view that there is no point in reducing drastically the dietary protein of elderly people who have hypertension, or as perhaps we should say, happen to have hypertension.

[1] *The American Journal of the Medical Sciences*, January, 1950.

EPIDEMICS IN SCHOOLS.

THE collection of data over a period of ten years by a committee appointed by the Medical Research Council has provided some interesting information on the occurrence and spread of epidemic disease in English schools. The committee was appointed in 1929, the aim of their study being twofold: first, to make a purely factual study of the incidence of epidemic illness, in the hope that this would lead to a better control of the group of diseases that in children gives rise to so much lost time and so much loss of health; second, to see how far the lessons taught in the study of experimental epidemics in the laboratory could be applied to human communities. The report on the first five years of the inquiry, 1930-1934, was published in 1938, but the committee were reluctant to draw more than tentative conclusions at that stage. Before the data of the second five years could be completed and analysed, war intervened, and only recently has it been practicable to study them. This study has now been undertaken by E. A. Cheeseman, of the Medical Research Council's Statistical Research Unit at the London School of Hygiene and Tropical Medicine.[1] In reporting his results, Cheeseman has made what use was necessary of the earlier records, so that his report covers practically a ten-year period. It is pointed out in the preface to this report that the two reports do not solve any epidemiological problems, but they reveal many epidemiological characteristics of great interest and put on a sound numerical basis much that was previously known in a more general way. Of particular interest were some of the findings relating to naso-pharyngeal infections, which were responsible for more sickness than any other individual cause; special attention is given to the apparent sex difference in their incidence. These "ubiquitous and iniquitous" infections—the sore throat, the "chill", the cold, the cough—together with influenza, accounted for more than half the total absences from school; and their reported incidence in girls' schools was considerably higher than in boys'. This difference may be due to stricter care in girls' schools and perhaps to a greater readiness of girls to report minor illness, but the interesting point is that certain other important findings may be related. For example, the spreading power of measles appeared to be greater in boys' schools than in girls'; a significantly greater proportion of outbreaks confined to a single case occurred in the girls' schools. If we accept the stricter care of girls, then earlier isolation of those with infectious diseases should occur, with greater limiting of spread; those with diseases whose prodromal symptoms are referred to the naso-pharynx, such as measles, will be removed from the classroom earlier, and a probable explanation is apparent of the spread of measles. Further, it was shown that *otitis media* and sinusitis succeeded colds more often than they did any other disease. In boys' schools the incidence rates of sore throat and of all naso-pharyngeal infection (excluding influenza) were directly associated with the rates of *otitis media* and sinusitis. In girls' schools the association with sore throat incidence was not statistically significant for either *otitis media* or sinusitis, but a "negative association" was observed between these complications and all naso-pharyngeal infections. This "negative association", Cheeseman states, implies that in girls' schools a high incidence rate of all reported naso-pharyngeal infections tended to be accompanied by a relatively low incidence of *otitis media* and sinusitis. It is possible that this, too, is associated with the greater care of minor illnesses usual in girls' schools. If this is the true explanation, Cheeseman states, "the apparently high incidence of naso-pharyngeal infection is less a cause for alarm than for emulation, since the results imply that in girls' schools the increased care taken to remove the mild cases of illness from the classroom has reduced both the incidence of more serious complications and the risk of wide dissemination of infectious disease". This appears to be, as Cheeseman suggests, the most important conclusion to be drawn from the study. Other points of interest also emerge, such as the small numbers actually affected in many cases of apparently widespread epidemics, the extremely high (and unexplained) relative incidence of appendicitis in naval schools, and the significantly high and direct association between the incidence of acute and subacute rheumatism and the incidence of scarlet fever. For the rest, the report contains a mass of carefully analysed facts and figures which should please the school medical officer, the epidemiologist and the statistician.

[1] "Epidemics in Schools: An Analysis of the Data Collected during the Years 1935 to 1939"; Privy Council. Medical Research Council Special Report Series, Number 271, by E. A. Cheeseman; 1950. London: His Majesty's Stationery Office. 9½" × 6", pp. 104. Price: 3s.

THE GUILLAIN–BARRÉ SYNDROME.

GUILLAIN, BARRÉ AND STROHL in their original communication laid down certain criteria for the diagnosis of the syndrome they described. About the first of these there has been complete agreement, for the peculiar dissociation of increase of the protein in the cerebro-spinal fluid from the cellular reaction is striking. The preponderance of motor over sensory changes has been commonly noted also, but the complete and rapid recovery they described was far from generally found in some series. We may ask whether this was due to the notorious variability of the nature of epidemics, and if so whether the condition was of infective nature or not; also whether the condition, infective or non-infective, was a pathological state *sui generis* or merely a pattern produced by several different states. We now know that the Guillain-Barré syndrome is not necessarily a specific condition. For example, it may be seen in diphtheritic neuritis, and also in palsies which appear to be due to traumatic stress, though in this instance, not having the advantage of proving the existence of a causal agent, we may be uncertain whether or not such an agent may not have taken advantage of the lowered resistance of a damaged part. Norman Reitman and Karl Rothschild describe two cases of this syndrome which gave rise to great difficulty in exact diagnosis.[1] The authors admit that the frequent association of this syndrome with proved infectious disease perhaps naturally leads to some bias towards assuming an infectious ætiology. They point out, however, that it is most important that certain diseases should not be overlooked. The two most important are poliomyelitis and diphtheria. The latter is often overlooked, especially when it is of the mild nasal or naso-pharyngeal type. Mild and atypical diphtheria was seen in many widely separated theatres of war during the last world war; in sporadic cases in the civil community it can easily be overlooked. One of the cases cited by Reitman and Rothschild was that of a man who eventually was found to have metastases from a bronchogenic carcinoma invading the spinal ganglia and nerve roots from the extradural fat. There was a history of pneumonia some weeks before the onset; this confused the true cause of the palsies which were the presenting signs, and which were accompanied by cellulo-protein dissociation in the spinal fluid. The other patient had signs of a diffuse myelo-radiculo-neuritis with the Guillain-Barré dissociation, thought at first to be due to serum sickness after the prophylactic injection of tetanus antitoxin. Later a Paul-Bunnell test suggested a diagnosis of infectious mononucleosis, but agglutination absorption tests disposed of this, and the cause remained obscure. However, discussion with a colleague trained in pathology suggested a possible mechanism for the increase in protein without any corresponding increase in cells, namely, an obstruction in the perineural spaces of the nerve roots which might allow absorption of fluid, but prevent the escape of the large-moleculed protein into the venous circulation, thus producing an increase of protein, but not of cells, in the cerebro-spinal fluid. Such blockage in the fluid circulation, if we assume the truth of the physiological assumptions involved, may be caused by several different pathological

[1] *Annals of Internal Medicine*, May, 1950.

processes; for example, inflammatory reaction, œdema due to an allergic cause, or metastatic growths. The authors point out that normal levels of protein have been found in the cisternal fluid while the spinal fluid had a much higher content of protein. This is an interesting speculation; at least it reminds us that when we speak of the Guillain-Barré syndrome we cannot assume that this describes any single pathological process or group of processes. It is an interesting finding, but its cause still has to be determined in any given case, and this may be obscure.

ANTIHISTAMINES AND THE COMMON COLD.

THE use of antihistamine drugs in the treatment of the common cold has obtained a good deal of publicity, though apparently not as much in Australia as it has overseas, especially in the United States. The claims of Brewster, the first published in this field, were referred to in these columns on May 21, 1949. Since then the procedure has been used widely, and indeed indiscriminately, and a number of investigators have published reports. Difficulties exist in the assessment of any remedy for the common cold, but the subject is of great practical importance. Two recent reviews of the evidence for the value of antihistamine treatment are of considerable interest. One of these, by Stuart Mawson,[1] while it is conservative and thoughtful, is not very critical. Mawson reviews the main reports on the subject, paying particular attention to those of Brewster, of Murray and of Arminio and Sweet. He refers to the difficulty in applying American results to the British field, because of possible undetermined differences in the organism and type of infection, and to the uncertainty of whether cures applied to the common cold or to rhinitis of allergic origin. However, he states that "one is bound to concede that a very great weight of evidence has been produced in favour of the 'Allergic Theory', that the earliest phases of the common cold are manifestations of an allergic reaction and are controllable by antihistamine therapy". At the same time he makes his view clear that "the apparent facility of cure should not signalize a wholesale ingestion of antihistaminics without due regard to their possible side effects", and these he describes. This, of course, is largely in line with the claims of those who have published reports favourable to the form of therapy and is what all would like to accept who have observed the symptomatic benefit produced by antihistamine drugs in the presence of nasopharyngeal congestion and nasal discharge. However, the Council on Pharmacy and Chemistry of the American Medical Association[2] is much more critical. In a detailed "status report" the council has examined the published results in terms of the following basic criteria: (i) The diagnosis should be established beyond reasonable doubt. (ii) Proper control series should be employed to eliminate chance. (iii) The results should be interpreted logically and present a study which is statistically significant. These are reasonable minimal standards, but none of the published reports examined by the Council (and they have covered much the same ground as Mawson) measures up to them fully. The conclusion reached is the only one that can reasonably be expected, namely, that "the investigations so far performed are only suggestive of the beneficial effect of antihistaminics for the common cold". They then go on to stress the undesirable and dangerous side effects occurring in an appreciable number of cases. The Council's report is, however, not destructive. The use of antihistamine drugs, while not regarded as of proven value, is still not dismissed, and, in view of the economic hazard presented by the common cold, a reliable evaluation is considered to be desirable. Positive suggestions are made for a satisfactory type of investigation, and it is to be hoped that this will be taken up by those with suitable material and facilities. One more recent report, by A. E. Feller *et alii*,[1] may perhaps be regarded as measuring up to the Council's standards. In this the effects of antihistamine drugs were observed on naturally occurring and on experimentally induced respiratory infections in human subjects. No beneficial prophylactic or therapeutic effect was demonstrated, and it seems likely that further adequately controlled investigations will support these findings. Meantime the practising profession will be wise to maintain a conservative view on the matter and to be on the lookout for side effects in patients indulging in self-medication.

[1] *St. Thomas's Hospital Gazette*, April, 1950.

[2] *The Journal of the American Medical Association*, February 25, 1950.

THE MEGALOBLASTIC ANÆMIAS.

THE story of the macrocytic anæmias is one of the most fascinating developments of modern medicine. Thirty years ago, Addisonian anæmia was a mysterious and truly "pernicious" disease, although remissions of varying duration could occur during its course. The first break in this obscurity came with the discovery of the anti-anæmic principle in liver and liver extracts. Since then our knowledge of the megaloblastic anæmias has gradually become clearer and at the same time more intricate, just as a landscape does when a fog lifts slowly. At first it was assumed that all cases of megaloblastic anæmia were caused by some disturbance in the supply, absorption, or utilization of the anti-anæmic principle found in liver extracts. Attempts were made to fit various types of anæmia into this plan, and to explain why the response to treatment with liver was unsatisfactory in some cases of sprue, and in the so-called "achrestic" anæmias. The advent of folic acid and of vitamin B_{12} has helped to clear the picture and at the same time to make it more complicated. It is no longer necessary, or indeed possible, to fit all megaloblastic anæmias into one scheme.

M. C. G. Israëls and J. Sharp[2] have reported five cases of idiopathic steatorrhœa (non-tropical sprue) with megaloblastic anæmia, that did not respond to treatment with liver or vitamin B_{12} but responded fully and completely to folic acid. In the same issue of *The Lancet*, I. M. Tuck and Norman Whittaker describe two similar patients. None of these patients were known to have steatorrhœa when treatment for anæmia was commenced; four of them provided little to suggest its presence and it was diagnosed only after fat-balance tests were performed. In each of the seven cases, gastric analysis revealed the presence of free hydrochloric acid; and all the patients responded promptly and fully to folic acid given by mouth or parenterally. Three of the patients were young women with infantilism or amenorrhœa; these symptoms disappeared under folic acid treatment without any endocrine therapy. The authors emphasize the difficulty of diagnosis and the fact that the fat-absorption defect may be missed.

Israëls and Sharp conclude that "there is a group of cases of megaloblastic anæmia in which the blood picture responds well to liver extracts, vitamin B_{12} and folic acids; and there is a second group that responds properly to folic acid but not to parenteral liver extracts or to vitamin B_{12} in doses suitable for the first group. Addisonian pernicious anæmia and nutritional macrocytic anæmia as seen in America and the West Indies fall into the first group; the second group comprises tropical and non-tropical sprue, "pernicious anæmia" of pregnancy and possibly most of the patients with nutritional megaloblastic anæmia in other parts of the world." The explanation of this is by no means clear; there may be yet other factors involved. There is, however, a clear lesson to be learnt: diagnosis before treatment is more essential than ever. Complete investigation should precede treatment with liver, folic acid or vitamin B_{12}; otherwise diagnosis is delayed; and, particularly in young patients, irreparable harm may be done.

[1] *The New England Journal of Medicine*, May 11, 1950.

[2] *The Lancet*, April 22, 1950, page 752.

Abstracts from Medical Literature.

OBSTETRICS AND GYNÆCOLOGY.

Face Presentation.

B. E. TUCKER, M. SOLOMKIN AND B. ABRAMS (*Surgery, Gynecology and Obstetrics*, February, 1950) present the statistics of face presentation deliveries for the past sixteen years at the Chicago Maternity Centre. They state that the only ætiological factors supported by the data were multiparity and original occipito-posterior positions. The cord was not found around the neck more often than in the service as a whole, but the authors state that fatal compression of the cord is more likely to occur in face presentation when the cord lies between the suboccput and the back of the neck. One prolapsed cord was noted; it was associated with a major operative procedure and resulted in a neonatal death. The weight of babies with face presentation did not differ significantly from the usual. The first stage of labour was slightly shorter and the second stage longer with face than with vertex presentations. The authors believe that with face presentations most patients will deliver the child spontaneously if allowed to do so. If operative procedure is indicated the simplest procedure is usually best. The low fœtal mortality in the series is considered to be due to a policy of non-interference while progress was being made.

Mid-Pelvic Contraction.

H. THOMS AND R. H. WYATT (*American Journal of Obstetrics and Gynecology*, February, 1950) discuss the clinical importance of mid-pelvic contraction. They state that the "mid plane of the pelvis" extends from the lower posterior border of the *symphysis pubis*, through the level of the ischial spines to the lower part of the anterior surface of the sacrum. The mid-plane transverse diameter is the shortest distance between the ischial spines, and the segment of the antero-posterior diameter lying posterior to this diameter is the mid-plane posterior sagittal diameter. The authors agree that the course of labour is most eventful at the line of the ischial spines, particularly with the fœtus in the occipito-posterior position; here the cardinal movements of internal rotation and descent must occur simultaneously, and flexion must be maintained or reestablished. Also there can be no serious outlet contraction without mid-plane contraction, and neither outlet configuration nor outlet morphology gives any indication of mid-pelvic capacity. In a study of 32 cases the pelvis was measured radiologically by means of the technique of Thoms and Wilson, and the authors emphasize the fact that these and other measurements can be obtained only by such a method. All transverse diameters of less than 10 centimetres (four inches) were regarded as evidence of mid-plane constriction, and these were divided into two groups—A with a range of 9·9 centimetres to 9·6 centimetres, and B less than 9·6 centimetres. In Group A there were 178 cases and in Group B, 172, and the operative incidence in the two respective groups was 37·8% (56 cases including four Cæsarean sections) and 55·9% (96 cases including 12 Cæsarean sections). When transverse mid-plane contraction is associated with antero-posterior shortening the operative deliveries rise to 63·5%. Cæsarean section was the procedure of choice with breech presentations at term associated with mid-plane contraction.

Retrolental Fibroplasia and Premature Birth.

H. SPEERT *et alii* (*American Journal of Obstetrics and Gynecology*, February, 1950) state that retrolental fibroplasia is the name given to bilateral formation of greyish-white connective tissue in the anterior part of the vitreous of the eye. Useful vision is impaired and partial or total blindness results in most cases. It is a recognized hazard of premature birth, and the past five years have witnessed a tremendous increase in the incidence of the condition. The ætiology of the condition is completely obscure, and the authors investigated 110 infants with the disease in an effort to provide basic clinical data; 105 infants in the series (96%) were born prematurely. No seasonal or geographic influence was found; the sexes were equally divided, but all were white; 17 of the 104 pregnancies resulted in multiple births, and there was a strong indication that in all monozygotic pregnancies both children were affected, whilst only one was affected in the dizygotic pregnancies. Cutaneous hæmangiomata were associated with retrolental fibroplasia in an incidence significantly higher than expected. Parental age, parity, previous obstetrical history, ante-partum bleeding, maternal infections during pregnancy, maternal medication during labour, type of labour and delivery, the results of serological tests for syphilis and the Rh factor had no ætiological relation. The authors conclude that efforts at reducing the incidence of the disease must be primarily in the prevention of premature birth.

Premature Separation of the Normally Implanted Placenta.

L. I. SEXTON, A. T. HERTIG, D. E. REID, FOSTER S. KELLOGG AND W. S. PATTERSON (*American Journal of Obstetrics and Gynecology*, June, 1950) review from the clinical and pathological viewpoint 476 cases of premature placental separation associated with 40,547 deliveries at the Boston Lying-in Hospital from 1931 to 1941 inclusive—an incidence of one in 85. Two groups, "toxic" and "non-toxic", were separated out, depending on the absence or presence of albuminuria and hypertension. In the "non-toxic" group there were 276 cases, an incidence of one in 133 deliveries, and in the absence of any known specific cause the ætiology must be considered as idiopathic. The "toxic" group consisted of 200 cases in 3654 patients with either proteinuria, hypertension or both—an incidence of one in 18·3. As the toxæmia became more severe, so did the incidence of premature separation increase. Fœtal loss in the "non-toxic" group was 34% with 101 stillbirths or neonatal deaths in 276 pregnancies; the mortality in the "toxic" group was 52%. There were 15 maternal deaths, three associated with the "non-toxic" and twelve with the "toxic" group. The deaths which occurred were associated with the moderate to severe types of cases. However, even in the toxic group it was often the associated complication which accounted for the high maternal mortality (9·2% corrected)—in two cases the mother died after successful delivery of bilateral cortical necrosis of the kidney and in one from shock and hæmorrhage associated with a defect in the blood-clotting mechanism. Treatment was mainly by the conservative method with artificial rupture of the membranes and pituitrin stimulation of the uterus if necessary. The authors advocate that the use of Cæsarean section be restricted to those patients who are not in labour, in whom vaginal examination reveals a cervix not effaced or dilated, and in whom there is no evidence of fœtal distress. As no patient in the series died from post-partum hæmorrhage due to uterine atony, the principle of hysterotomy followed by hysterectomy is not advocated, and it is concluded that if hysterotomy has a place in the treatment of the condition it must be concerned with problems associated with labour and delivery. The association of a defect in the clotting mechanism of the circulating blood in one "non-toxic" and one "toxic" case prompts the authors to recommend rapid investigation of the clotting ability of the blood when the patient is first admitted to hospital and specific treatment in relation to fibrinogen, vitamin *K et cetera*.

Spontaneous Subperitoneal Hæmorrhage Complicating Pregnancy.

HENRY ROBERTS (*The Journal of Obstetrics and Gynæcology of the British Empire*, December, 1949) reports a case of spontaneous subperitoneal hæmorrhage in a *multipara* at the thirty-second week of pregnancy. He states that a review of the literature allows these cases to be placed into five main groups: (i) Those occurring with antepartum hæmorrhage and associated with signs of pregnancy toxæmia. The hæmorrhage in these cases usually arises from rupture of vessels in the broad ligament and vessels on the peritoneal surface of the uterus and may spread under the peritoneum of the posterior abdominal wall as high as the kidney or even the diaphragm. (ii) Those following spontaneous delivery. The hæmatoma is said to arise in the broad ligament without injury to the uterine wall or cervix; the pathological basis of the bleeding has been put down to spontaneous capillary bleeding. (iii) Those associated with incomplete rupture of the uterus. (iv) Those due to rupture of an aneurysm. Twenty-five cases of which two did not end fatally have been reported of rupture of a splenic aneurysm in pregnancy; this produces a massive subperitoneal hæmorrhage in the region of the pancreas, spleen and kidneys. A definite relationship between this condition and pregnancy is postulated, as a change in the size of the spleen and its blood supply is extremely common in all pregnancies. No records of aneurysm of the uterine artery are reported. Rupture of the aneurysm occurs as a rule between the twenty-eighth week and term and does not depend on the strain of labour—alteration of the blood lipoids has been suggested as a causal factor. (v) A miscellaneous group. This contains such rarities as intraligamentary rupture of an ectopic pregnancy, rupture of varicosities of the broad liga-

ment, rupture of hæmorrhoidal veins and extravasation into the broad ligament from rupture of the *rectus abdominis* muscle. The author states that the diagnosis of the condition is very difficult; the constant features appear to be severe pain, sudden in onset and usually of a tearing nature, collapse with signs of internal hæmorrhage, a palpable tender mass in favourable cases, and sometimes signs pertaining to the underlying cause or predisposing factor such as aneurysm or toxæmia. Conditions which resemble subperitoneal hæmorrhage are concealed accidental hæmorrhage, spontaneous rupture of the uterus, extrauterine pregnancy in the broad ligament, volvulus or torsion of a viscus, and intraperitoneal hæmorrhage. In treatment the surgeon has to decide whether exploration with or without drainage or non-intervention is to be the procedure of choice in the individual case.

Surgical Treatment of Sterility.

H. N. RUTHERFORD, H. M. LAMBORN AND A. L. ZANKS (*American Journal of Obstetrics and Gynecology*, October, 1949) report their results in the surgical treatment of obstructed Fallopian tubes in 43 cases of primary and secondary sterility unrelieved by persistent pressure treatment. In all there were 27 cases of primary sterility in the group and 16 cases of secondary sterility. All patients had been treated non-surgically with œstrogen, thyreoid and pressure insufflation, and when these had failed were given the choice of adoption of a child or exploratory laparotomy. Experiences with peritoneoscopy and culdoscopy to evaluate the extent of the tubal damage were most unsatisfactory. The types of obstruction were classed as perisalpingitis (seven cases), fimbrial occlusion (16 cases), isthmic occlusion (11 cases) and interstitial obstruction (six cases). The best results came in those cases in which the least had to be done, as in simple lysis of peritubal adhesions and in cases of uncomplicated closure of the fimbriæ. There were 15 successes in 23 cases when the diagnosis was perisalpingitis or fimbrial occlusion. When there had been a disorder of mucosal pattern or impaired blood supply, or when the surgical procedure interfered with tubal innervation, results were poor. The after-care was important in that the patients were given both sulphonamide and penicillin therapy from twenty-four hours prior to operation to five to seven days after operation. Tubal insufflation was carried out forty-eight to seventy-two hours after surgery and continued every three days thereafter until tubal patency was established and maintained for three tests.

Ovarian Carcinoma Arising in Endometriosis.

GEORGE W. CORNER, JUNIOR, CHIH-YUAN HU AND ARTHUR T. HERTIG (*American Journal of Obstetrics and Gynecology*, April, 1950) report a study of 265 cases of carcinoma of the ovary and 889 microscopically proved cases of ovarian endometriosis in an attempt to ascertain the histogenesis and relative frequency of malignancy arising in ovarian endometriosis. They claim that three undoubted cases and three highly probable cases of ovarian carcinoma arising in ovarian endometriosis occurred in the series studied and can be added to the eight previously recorded cases in the literature. Sampson's contention that ovarian carcinoma may often arise in endometriosis has not been proven. The authors found that ovarian neoplasms of all types associated with endometriosis had an incidence of only 7·9%, and malignant neoplasms were present in only 1·7% of cases. Premalignant changes, such as anaplasia and papillary formation, occurred in 1·2% of the series, and 2·3% of the ovarian carcinomata appear to have arisen in endometrial cysts. Definite or potential malignant changes in ovarian endometriosis were observed in 2% of cases. Details are given of nine cases studied which appear to support the theory of cœlomic metaplasia in the origin of endometriosis. One cyst is reported as showing an area of undifferentiated epithelium, an area of endometriosis and an area of pseudomucinous epithelium. The authors think it possible that serous cysts, pseudomucinous cysts and endometriosis may all arise from ovarian germinal epithelium. It is suggested also that other than endometrial-type carcinoma may arise within endometrial cysts. They consider that the evidence suggests that several different patterns may arise from polydifferentiation of original germinal epithelium rather than from metaplasia in the areas of endometriosis. Details are given of the six cases in which carcinoma arising in endometriosis seemed probable.

Complete Abdominal Hysterectomy.

ALBERT H. ALDRIDGE AND RICHARD S. MEREDITH (*American Journal of Obstetrics and Gynecology*, April, 1950) report the end results of 500 cases of abdominal total hysterectomy and describe and illustrate a simplified operative technique. They state that the operation of total hysterectomy is a relatively safe procedure in the hands of competent surgeons and that there is little difference in the incidence of mortality and morbidity following the subtotal and total operations. The advantages of removing the cervix with the body of the uterus are as follows: troublesome post-operative pelvic symptoms caused by chronic cervicitis are eliminated; an occasional unsuspected early carcinoma of the cervix is removed; the risk of subsequent development of cervical cancer is prevented; post-operative menopausal symptoms are relatively less frequent and less severe than after the subtotal operation. Of the patients in this series who required hysterectomy 85% had chronic inflammatory lesions, unhealed birth injuries or malignant disease of the cervix. The authors state that some cervices which appear normal at the time of subtotal operation do not always remain normal. Ligature of the uterine vessels during removal of the body of the uterus interferes with normal blood supply to the cervical stump and predisposes to infective and degenerative changes in the cervical glands. Of all cervical carcinomata which come under treatment, 6% to 7% originate in cervical stumps after subtotal hysterectomy. The authors describe and illustrate a technique of total abdominal hysterectomy which they consider can be safely used as nearly a routine procedure. The technique is not claimed to be original, but is described as a combination and modification of various steps which have been described by Worrall, Richardson, Danforth and others. The following details in operative technique are stressed: the utero-sacral ligaments are not ligated and cut, but are displaced backwards as the fascial cuff is detached from the posterior aspect of the cervix; the transverse cervical ligaments are clamped and cut inside the fascial cuff which surrounds the cervix; the angle sutures in the cut vaginal vault pass around and include the ligated stumps of the transverse cervical ligaments; the remaining part of the vaginal vault is closed with a continuous chromicized suture; the fascial cuff is closed over the sutured vaginal vault with another continuous stitch; the proximal ends of the round, broad, utero-ovarian and infundibulopelvic ligaments are never fixed to the vaginal vault to facilitate peritonization or as a means of support for the vagina (the authors consider that such a procedure is unnecessary and useless and may interfere with the blood supply of the ovaries and cause post-operative pain and dyspareunia); where the vaginal vault is poorly supported the cut vault is sutured from before backwards instead of transversely, and the fascial cuff is sutured in the same direction; the proximal ends of the transverse cervical ligaments are brought nearly into apposition in the mid-line. There were two post-operative deaths in the series of 500 total hysterectomies: one patient died suddenly of pulmonary embolus on the ninth day after operation; the second patient was a treated subject of long-standing syphilis, who did not regain consciousness after operation, death being due to cerebral embolus. There were no bladder or ureteral injuries in the series recorded. Of patients followed after operation 26% required treatment for post-operative menopausal symptoms. This operation is not recommended by the authors for patients having hysterectomy for *carcinoma corporis uteri*; more parametrial tissue and more vaginal vault should be removed when such cancer is present.

Ruptured Uterus after Lower Segment Cæsarean Section.

R. F. LAWRENCE (*The Journal of Obstetrics and Gynæcology of the British Empire*, December, 1949) gives the figures for the University of Leeds of cases of ruptured uterus in patients delivered in the hospital after a previous lower segment Cæsarean operation, irrespective of where the original operation was performed. He states that the literature of the past fifteen years contains only a small number of published cases occurring after lower segment section, and that there appear to be none in which rupture occurred before the onset of labour. Calculation of the risk of rupture should, therefore, be based only on cases in which the scar was subjected to the test of labour. Among 353 patients with 472 subsequent pregnancies, labour of at least three hours' duration was permitted on 310 occasions. The outcome in 121 cases was natural delivery and in 189 cases repeated Cæsarean section was performed. Rupture of the uterine scar occurred on two occasions, an incidence of 0·65%. The author concludes that the risk of rupture is so small as to justify a policy of trial of labour regardless of the indication for the previous operation.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held on July 5, 1950, in the Medical Society Hall, East Melbourne, DR. ROBERT SOUTHBY, the President, in the chair.

Symposium on Rubella.

DR. S. G. ANDERSON read a paper entitled "Epidemiological Aspects of Rubella" (see page 389).

DR. H. MCLORINAN read a paper entitled "Diagnosis and Prophylaxis of Rubella" (see page 390).

DR. W. M. LEMMON read a paper entitled "Rubella in Pregnancy: The Obstetrician's Problem" (see page 392).

DR. A. P. DERHAM congratulated the speakers on their papers. He said that he felt he would like to protest against the term "deaf-mutism". That term was incorrect, as the babies concerned were not mute and could be taught to speak if treated properly. He pointed out that the Education Department took responsibility for these children only at school age; before that no one was responsible, except private groups of individuals. That was often very tragic. Dr. Derham said that he had always been taught as a student that syphilis was the commonest cause of congenital deafness, but there must be other causes besides syphilis and rubella; for example, he had recently encountered a case apparently due to severe sinusitis occurring in the third month of pregnancy.

DR. GUY SPRINGTHORPE asked Dr. Anderson whether his first test patients who were inoculated with rubella virus were carefully watched in the ward, or whether it would have been possible for any of them to run a temperature for a few hours which might have been missed.

Dr. Anderson, in reply, said that these patients were watched closely up to the eighteenth day, but that after that some pyrexia might have gone unnoticed.

DR. H. LAWRENCE STOKES stated that the commonest congenital heart lesion following rubella was the patent *ductus arteriosus*. He wondered why that should be so. He also asked Dr. Anderson whether any recent work had been done in the attempt to link other viral diseases with congenital defects.

Dr. Anderson, in reply, said that he thought that theoretically some mechanism which was responsible for closure of the ductus months later might be upset in the first four months of pregnancy, as a consequence of rubella. With regard to the importance of other viral diseases, poliomyelitis had recently been suggested, and in THE MEDICAL JOURNAL OF AUSTRALIA recently, measles had also been discussed as a cause of congenital defects. It was possible that other diseases, such as mumps, might also be found to produce deformities.

DR. IAN WOOD asked whether the fœtus had the disease with its mother or was infected later. Would it be rational to give γ-globulin after the mother had developed a rash?

In reply, Dr. Anderson said that the method of production of fœtal lesions was still uncertain. It might be that the virus multiplied in the cells of the fœtus or that there could be toxic damage to the fœtus. The best results from the use of γ-globulin might be expected to occur if it was given just before viræmia developed, but when that occurred was uncertain and therefore it was best to give the injection as early as possible.

Dr. McLorinan, in reply, said that he thought Professor Fenner had proved that there was a high antibody content in mice suffering from ectromelia at the time of the rash. He felt that the same might apply in rubella, and it would therefore be no good giving γ-globulin late in the disease when the rash had appeared.

DR. KELLY asked Dr. McLorinan whether he thought the features of rubella had altered over the last few years. Had he noticed that in the early 1940's a common complication was neuritis, a finding that was written up in the journals at that time? Also, had rubella always been common in married women?

Dr. McLorinan, in reply, said that Gregg had noted that rubella was becoming more severe. He himself rather doubted that. Before 1938 rubella had been very rare; there had been only one other epidemic in Melbourne—in 1924. No patients with rubella were admitted to Fairfield between 1930 and 1938. He felt that this meant that possibly the symptoms had been forgotten, and he did not think there were any new symptoms. With regard to neuritis, he would always question the presence of streptococci with any manifestations of severe rheumatism.

DR. W. D. SALTAU asked whether the present legal position regarding termination of pregnancy could be altered.

Dr. Lemmon, in reply, pointed out that at present there were no accurate figures on the liability of rubella to cause severe malformations in the fœtus. It was therefore useless to make any approach to the legal authorities.

DR. JOHN HEATH asked Dr. Anderson whether the γ-globulin should be given in one dose or in divided doses; also, why rubella was called "German measles".

Dr. Anderson, in reply, said that it had been their custom to give the injections in one dose at the present time, and that appeared to give good results. He did not know the answer to the second question.

DR. JOHN COLEBATCH said that he felt that the actual diagnosis of rubella was often a problem. He had had to see a large number of these patients and the condition of many of them was straight forward; but a large number seemed to present features of both rubella and morbilli, or to have some atypical features. Often there was little or no glandular enlargement, and in other cases the rash occurred some forty-eight hours after the fever. Could these patients really have *exanthem subitum*? There was often an enlarged spleen in these cases. Dr. Colebatch wished to ask which of the above features Dr. McLorinan thought most useful in differentiation and also whether *exanthem subitum* was rare in Victoria at present; secondly, if the case was one of *exanthem subitum*, whether the mother could be reassured that no congenital defects would occur in her child?

Dr. McLorinan, in reply, said that he believed that glands were enlarged and tender in 75% of cases of rubella. In another 10% they were large but not tender. He thought that the onset of the rash after the appearance of fever occurred very soon—usually not more than twenty-four hours later. He did not think that the spleen became enlarged in rubella, and he would be inclined to doubt the diagnosis in those cases. The differential diagnosis between rubella and *exanthem subitum* was difficult. He did not believe that catarrhal symptoms occurred with the latter, and he thought the rash was more patchy, but in all cases of doubt, he would suggest giving serum to the mother.

DR. COLE said that he thought it important that the difference between rubella and measles be made clear to the general public, so that they would not confuse the two. He thought, therefore, that the term "German measles" should not be used by the profession.

Dr. Robert Southby, from the chair, said that he believed that the Council of the Medical Defence Association always dealt with any case which came before it on its particular merits, and unless there was an obvious flagrant breach of medical etiquette, the Council would take up the case. If the position ever did arise of a doctor being prosecuted in a rubella case he was sure that the Council would give the application very sympathetic attention. Dr. Southby wished to ask Dr. McLorinan whether he knew why rubella was so variable in its infectivity. He himself had contracted it unexpectedly; he had been in close contact with two patients whom he had been anæsthetizing and with the operating theatre staff just before the rash became manifest, and yet no one had contracted it. Some years later his own children had been infected from a different source. He asked also if Dr. McLorinan could say why it was that the occipital and mastoid glands were the ones picked out.

Dr. McLorinan, in reply, said that he was unable to answer Dr. Southby's questions.

A MEETING of the New South Wales Branch of the British Medical Association was held at the Robert H. Todd Assembly Hall, British Medical Association House, 135 Macquarie Street, Sydney, on May 25, 1950, the Past President, DR. J. KEMPSON MADDOX, in the chair.

Allergy of the Upper Part of the Respiratory Tract.

DR. BERNARD RILEY read a paper, prepared by DR. R. S. STEEL, entitled "Allergy of the Nose and Throat" (see page 394).

DR. B. B. BLOMFIELD read a paper entitled "Nasal Allergy" (see page 396).

DR. R. J. MURPHY thanked the speakers for their papers on what was a most distressing condition for him, speaking as an ear, nose and throat surgeon, who was looked on as an executant and was expected to do something. He had always felt very unhappy about the position and unqualified to deal with it, as he felt that he did not know the basis of allergy. He had been struck by the fact that Dr. Steel quoted a figure of 68% for those with allergy of familial origin; it appeared from that, that the problem was solved. Dr. Blomfield, however, saw the difficulties and had made an attempt to help in the applied field. If Dr. Steel's figure of 68% was correct, Dr. Murphy had been unfortunate, as he had had to deal with the other 32%, and that was not so easy. He sometimes felt like crying; *"Agnosco, mea culpa, mea culpa!"*. He wondered if there were any others who knew more than the ear, nose and throat surgeons, and felt that they should look to the physician, the endocrinologist, the pathologist and the biochemist. It was a problem to understand the allergic condition and decide whether a particular patient had the manifestation of allergy, bacterial infection or virus infection. Very often a fair assessment could not be made. Dr. Murphy was pleased that Dr. Steel had referred to the widely varying appearances of the mucous membrane of the nose; examination of the nasal mucous membrane did not always reveal whether or not a condition was allergic, or due to bacterial or virus infection. He wondered if there was a common basic factor. The manifestation might be one of something essentially endogenous rather than exogenous. It remained to be shown why a healthy person became invaded and dominated by virus, pathogen or allergen without having a relevant family history; there was some link, and the onus was on the scientific people to find it. If those factors were the triggers, then they were only triggers to some complex chain of events. Further effort needed to be made of a cooperative type to find the basis of allergy and the possible endogenous factor concerned.

DR. D. G. CARRUTHERS said that he did not agree with Dr. Steel on the question of the specific appearance of the nasal mucous membrane; in his experience an allergic condition could very nearly always be detected on the basis, firstly, of the history and, secondly, of the appearance of the nasal mucous membrane. He did not think that looking for eosinophilia in the nasal secretions was very useful in diagnosis; in an investigation at Sydney Hospital, eosinophilia had been found in very few cases of allergy, and it was most deceptive in that it had been found in one or two cases that were obviously infective. Speaking of the development of clinical allergy after nose and throat operations, Dr. Carruthers said that he found it useful, if the patient had a family history suggestive of allergy, to give antihistamines before and after operation. It was necessary to remove nasal polypi in practically all cases; he had not seen them absorbed, and considered that often other means were required, such as radium therapy, to stop recurrence. Bacterial allergy was difficult to diagnose, but apparently it did occur; perhaps there were other factors involved, and Dr. Carruthers did not know whether or not it was true allergy. His experience was that the use of vaccines might help in what was presumably bacterial allergy; he restricted the dosage to keep just below a local reaction and wondered if that procedure was right. He believed that there were many other factors besides the allergic tendency; the emotional factor was very important and most difficult to overcome. A good deal of face-saving had been made possible by the antihistamines, which were most valuable. Dr. Carruthers had found desensitizing allergens disappointing.

DR. S. BRIDGEMAN referred to hyperæmia of the skin of the nose and dark rings under the eyes as diagnostic criteria of allergy, and asked whether in their absence a patient could be regarded as allergic.

DR. L. E. HEWITT, in reply to Dr. Carruthers's question about vaccines, said that most people handling vaccines tended to give an overdose. He thought that one was far more likely to get good results if the dose was kept under that causing local or general reaction; local reaction indicated that the dose was probably an overdose, general reaction that it was certainly an overdose.

DR. CLIVE C. SANDS said that for the purpose of the meeting he had made a survey of 500 consecutive case histories of allergic patients, and found that of the 500 patients, 255 had had operations of some sort to the nose or throat. The 500 cases were of all types of allergy, and therefore the figures were weighted to the advantage of the ear, nose and throat factor. Dr. Sands had therefore decided to dissect them further. The age varied from three weeks to seventy-eight years. He considered that children under three years of age would not have had operations, and therefore extracted the cases of the 55 children involved. They represented five cases of operation. In one case, symptoms of asthma were positively stated to have commenced after operation. Next there were a large number of cases of skin allergy, and Dr. Sands considered that the patients concerned would be less likely to have had nose or throat operations than would those with allergy of the respiratory or gastro-intestinal tract; there were 126 in this group, 20 of whom had had operation, and two of whom were quite definite that symptoms were worse after operation. The 500 cases were by that time reduced to 383, and the nose and throat operations were reduced to 230; that is, in 60% of the cases of allergy in which the respiratory tract, gastro-intestinal tract, ears, eyes, bladder, or meninges had been involved the patients had had operations. Dr. Sands pointed out that Bray, writing in "Recent Advances in Allergy", in 1931, had given numerous figures with regard to such operations and their effect. He gave a figure round about 60% for a similar statistical approach. It would therefore appear that little advance in the last generation had been made with regard to the surgical approach to allergy. The operations varied from routine removal of tonsils and adenoids, their removal for definite reasons, application of the cautery, and submucous resection of the nasal septum to various operations on the sinuses; till in some cases one wondered that there was anything remaining behind the face that one was watching. Seven of the patients were positive that their symptoms commenced after operation; 11 declared that they were made worse by operation; 49 volunteered the statement that operation was of no value, or of no benefit, or that they were no better; 21 stated that they had had slight or temporary improvement. The remainder, 295 patients, did not make any definite remark about operations. The fact that they had arrived at the allergist's waiting room explained the result.

In the 500 cases reviewed, Dr. Sands had made special inquiry as to the results of operations. If a subsequent 500 cases had been chosen, in which he had gone more fully into that section of the history, the evidence would have been still more striking. On the evidence presented alone, he was inclined to form the opinion that operations did not cure allergic conditions. Where slight improvement was reported, it was generally in patients who had had operations less than two years previously. Dr. Sands felt that there were possibly two explanations: firstly, that allergic conditions were not recognized before operations were recommended; secondly, that surgeons, in recommending operation, were forgetful of the fact that allergy was a condition involving the whole organism, and not one organ. Although one organ might be a "shock" organ at a particular time, nevertheless, any patient might show a variety of symptoms at different periods of his life, and generally more than one type of symptom at any one period.

DR. R. H. BETTINGTON said that he was pleased that Dr. Steel had said that the surgical approach to the antrum should not be based on the appearance of the X-ray film; that particularly applied to allergic conditions. He wondered if Dr. Sands had meant that the surgeon should not touch polypi or the nasal septum. Certainly the allergic nose should not be interfered with lightly, but in certain types of conditions the patient was much benefited by surgical treatment; the removal of polypi brought relief, even if it had to be repeated. Dr. Blomfield had said that polypi were always allergic, but Dr. Bettington thought that it was difficult to be sure of that; evidence of allergy was occasionally missing. He agreed that cauterizing the inferior turbinate was often helpful; if on anæsthetization much shrinking of the nasal mucous membrane or turbinate occurred, cauterizing would be of benefit, but if no shrinking occurred, it would not help, and nothing would affect the turbinate short of surgery, which was not desirable. Dr. Bettington supported Dr. Carruthers's view that emotional factors were important, and cited cases of children who were relieved of allergic conditions on separation from their parents, only to suffer relapse on being reunited with them.

DR. DAVID ROSS said that he was interested in the emotional side of the question, and thought that he could put a weapon into their hands which would help them in dealing with allergic patients. The basis of those conditions was always partly allergy and partly emotion. Like all psychosomatic disorders, the allergic condition was not caused by the present life situation, by a state of affairs known to the patient; the important factor was underlying nervous tension activated by the present situation which acted as a trigger. Dr. Ross felt that that nervous tension was probably the unknown factor referred to by Dr. Murphy, and in a case of allergy they must look for the basic conflict; that had been worked out by Flanders Dunbar as one of repressed

hostility. Dr. Ross referred to the case of the only child, who was the subject of excessive fussing and care by the mother. He suggested that one reason for the fact that it was an only child was that the mother did not want any more children, and in fact had not wanted the only child either; the mother's sense of duty repressed that fact, and over-compensation occurred. The child, however, was not deceived and manifested its resultant hostility through an allergic nose and asthma. If a child, or an adult, could manifest its hostility in some other way, it would help; a complete cure might not be effected, but they would be making an approach to the basic factor which they were seeking. It was necessary to think of a basic conflict and that in terms of repressed hostility, and to encourage the timid, frightened patient to manifest his hostility in a more adult fashion.

DR. A. L. BRYANT asked Dr. Blomfield if he had ever injected sclerosing fluid into the turbinates. He reminded Dr. Sands that operation was not intended to cure, but to remove distressing symptoms.

DR. GARNET HALLORAN said that he had not been happy about the results of desensitization. He asked Dr. Riley how much importance could be attached to moulds in relation to allergy; the Dutch thought that they were important, at least in allergic rhinitis.

Dr. Maddox, from the chair, said that he often asked himself how much the general practitioner would be helped by attendance at Branch meetings or by reading the papers and discussion in THE MEDICAL JOURNAL OF AUSTRALIA. It was obvious that all patients could not be sent to allergists; everyone had to have some elementary knowledge of the subject, and he felt that those who read the papers and the discussion would be shown that they had to achieve some of the basic concepts to treat their patients intelligently.

Dr. Riley, in reply, remarked that the important thing that often emerged from the preparation and reading of a paper at a meeting was the realization of what they did not know. On the subject of allergy they were still floundering. There were three main theories, associated with heredity, histamine and bacterial allergy, but it was not really understood. He considered that the lack of interest in allergy was astounding. Much time must be spent on it. It affected 10% of the population, and was therefore important; the problem belonged to everybody. Dr. Riley pleaded for greater interest in allergy on the part of the general practitioner, for more teaching on the subject of medical students, including the setting of a question on it in their examinations, and for investigation by the pathologist, bacteriologist and biochemist. He went on to say that Dr. Hewitt's advice about the use of the von Pirquet test was good, but personally he had been unable to obtain satisfactory bacterial antigens. Dr. Halloran's question about moulds exemplified how little had been done; a few investigations had been carried out, but at present mould extracts had to be imported. Dr. Riley considered that moulds were very important allergens, and that their investigation was badly needed, as was a satisfactory pollen survey. In reply to Dr. Bridgeman, Dr. Riley said that he had no comment to make as he had not observed the criteria mentioned as manifestations of allergy. In conclusion he hoped that some of the money allocated for research would be used for the investigation of allergy and that all the profession would cooperate.

Dr. Blomfield, in reply, said that he had had no experience with sclerosing fluids and so could not offer any comments to Dr. Bryant. He supported Dr. Riley in his remarks about the need for greater interest in allergy.

Dr. Maddox, from the chair, thanked Dr. Steel and Dr. Blomfield and those who had contributed to the discussion.

A MEETING of the Section of Neurology, Psychiatry and Neurosurgery of the New South Wales Branch of the British Medical Association was held at the Mental Hospital, Parramatta, on May 4, 1950. The meeting took the form of a series of clinical demonstrations by members of the medical staff of the hospital.

Sexual Psychopathy.

DR. S. G. STEVENS presented four male patients illustrating criminal sexual offences. The first two of this group, two brothers, mental defectives, illustrated the two homosexual types, one the active, aggressive type, the sodomist, the second the passive, timid, "feminine" type. Dr. Stevens said that the former type was the aggressor and instigator of the crime and generally chose the latter type for "youth and good looks".

The early history of the brothers had been uneventful. Two years previously the father had died. The mother was unable to control the brother of aggressive type or to protect the one of passive type from his brother. The brother of aggressive masculine type, the sodomist, aged twenty-one years, had a narrow body with well-developed sex organs, was the shorter of the two and had a mental age of six and a third years. He was mentally dull with a vacant stare accentuated by the fact that the mouth was kept open. The brother of passive "feminine" type, aged eighteen years, had a "feminine" type of body with small genitalia and enlarged pubic fat. This patient had a large face with a wide, usually smiling mouth. Dr. Stevens postulated that mental defectives with an intelligence quotient less than 70% based on fourteen years did not know the differences between socially right and wrong acts.

The next two patients illustrated heterosexual crimes. The first, a male patient, aged thirty-four years, with a diagnosis of paranoid schizophrenia, in the past six years had developed delusions that women were following him about. Altogether, he made six attacks on women. His only explanation was that they were annoying him in a cunning, underhand manner. The last patient, a male mental defective, very childish, was mute and small in size and build, being five feet high. His body was of feminine type, while the genitalia were over-developed. The history of the case was that there was a woman in a telephone box; the patient pulled her skirt off, turned her around and attempted rape.

General Psychiatric Conditions.

DR. B. H. PETERSON presented a married man, aged fifty years, a foreman in a responsible position, who had been admitted to hospital on March 30, 1950, having been certified a few days earlier. He was depressed and tearful, and admitted having uncontrollable outbursts of temper since a "nervous breakdown" two years before. He had delusions of persecution by his family, complaining that his wife and three children were opposed to him and spending all his money. He had had headaches most of his life, like his mother and sister. He said that they began behind his left eye and then spread across his forehead and around his head. They were often accompanied by blurred vision and vomiting, but never kept him awake at night. The patient was the eldest of a family of five. He had been an average scholar at school, and then worked for several years on his father's farm. He said that he was always popular and was usually master of ceremonies at the country dances. Later he worked on various metropolitan building and construction projects, usually in the capacity of foreman. As a boy he had fallen off his bicycle and suffered concussion, being unconscious for two hours. Ten years before his admission to hospital he had had mumps orchitis. His wife said that their marriage had been fairly happy until two years before, although he had always been obstinate, impulsive and liable to take offence with his own family, while enjoying the social limelight away from his home. At that time he lost a lot of money gambling, and became so depressed that he was unable to continue working. He became very irritable and accused his wife and children of spending all his money. This accusation had little foundation in fact. He took to his bed for three months. A course of electroconvulsive therapy in a private hospital brought about temporary improvement, but soon he became annoyed with his family again and lived on his own at an hotel for five months. On his return home he was as depressed as ever, and over-indulgence in alcohol only made him more irritable. He often threatened suicide, and two weeks before admission had put his head in the gas oven. His customary headaches became worse, and the family doctor suggested that he might have a cerebral tumour. Arrangements for suitable investigations were made, but his mental state became worse, necessitating certification. Physical examination revealed no abnormality of the central nervous system or ocular fundi. He was corpulent, weighing seventeen stone. The result of a Wassermann test was negative. The cerebro-spinal fluid rose to a pressure of 240 millimetres of water, but neither the number of cells nor the amount of globulin was increased and the colloidal gold curve was within normal limits. The electroencephalogram was reported as normal and plain X-ray examination of the skull revealed no evidence of intracranial lesion.

During the discussion which followed, Dr. Peterson asked Dr. Gilbert Phillips whether the high cerebro-spinal fluid pressure might be due to the straining of a corpulent patient to get into a position of flexion for lumbar puncture. Dr. Phillips replied that that might be the case, provided that other causes such as constriction of the neck by tight clothing had been excluded. Dr. Phillips was then asked

whether there was sufficient evidence to exclude an intracranial lesion, so that electroconvulsive therapy could be proceeded with. He said, in reply, that the possibility of a basal aneurysm still remained, and advised angiography; he suggested that the presence of such an aneurysm might account for the migrainous headaches.

Dr. Peterson's second patient was a single man, aged twenty-three years, a wireless mechanic, who had been admitted to hospital as a voluntary patient on April 20, 1950, complaining of amnesic wandering attacks over the last four years. The patient was third in a family of eight, who lived in a Sydney suburb. One sister had had a "nervous breakdown" at the age of ten years. The father, a labourer, was a heavy drinker, and the wife and children were afraid of him when he was drunk. The patient was smart at school and sometimes came top of the class. He was keen on mechanics and swimming, and mixed well with his fellows. His previous illnesses included scarlatina, diphtheria and occasional attacks of asthma, and a radical antrostomy had been performed at the age of eleven years. He had suffered nocturnal enuresis until the age of twelve years. In 1944, when sixteen years old, he had become a naval gunner on a United States destroyer, and during an action in the tropics an enemy shell hit the shield of his gun. The blast knocked him unconscious for forty-eight hours. He made an uneventful recovery, but five weeks later he suddenly felt dizzy and fainted. The medical officer on the destroyer said it might have been due to the after effects of the shell blast, and told him to "report sick" if he noticed similar symptoms in the future. He remained well until two years later, when, a few hours after a slight accidental bang on the head, he had a similar faint turn at the home of a friend. His father was called and, arriving in a drunken state, accused him of being drunk. He felt humiliated by the scene his father made and refused to return home with him. He found accommodation at a boarding house, but over the next few weeks was depressed and had severe headaches. He thought these and the fainting turn were probably due to the shell blast, and was worried and upset over leaving home. One evening he walked out the front gate of the boarding house for a walk—and awoke two days later in a hospital at Cessnock. He was told that the police had found him wandering the streets not knowing his name or whereabouts. He said that, apart from a feeling of fatigue, he was quite normal when he "awoke". He returned home, and had some electroconvulsive therapy at Broughton Hall, but this, he said, made him feel worse. He gradually became well again and returned to work, but a year later a similar episode occurred following severe hæmorrhage from a tooth extraction; this time he found himself in Victoria after three days of wandering of which he had no recollection. Several wandering attacks had occurred since then, especially over the last three months, when he had been worrying as to whether he should tell his girl friend about them and about the shell blast that he thought was the cause of them. At times he feared insanity and said that he would commit suicide if he thought he was really going insane. The patient was anxious and thin on admission to hospital, but no other physical abnormality was found. The result of a Wassermann test was negative, and the cerebro-spinal fluid and plain X-ray appearances of the skull were reported normal. He was having a course of subcoma insulin therapy, and his physical condition was improving rapidly. The provisional diagnosis was anxiety hysteria, with hysterical fugues.

During the discussion, DR. E. S. MORRIS asked the patient further details of his fugues. DR. D. ARNOTT then asked what further treatment was contemplated. Dr. Peterson replied that it was proposed to try to recall the original shell blast events and the fugues with the patient under "Pentothal" narcosis. After that, further psychotherapy would be required to reassure the patient and to help him adjust himself to his problems in a more healthy manner. The patient had already recalled the events of one fugue while recovering from an insulin sopor.

Demonstration of Physical Treatment.

DR. F. J. SCANLAN demonstrated the use of relaxing agents in electroconvulsant therapy. He compared the effects of two such drugs, "Tubarine" and "Flaxedil". He said that the former was packed in ampoules of 1·5 millilitres, which contained 15 milligrammes of "Tubarine"; the usual dose range was 12 to 25 milligrammes. "Flaxedil", a synthetic product, was packed in ampoules of two and three millilitres, each millilitre containing 40 milligrammes of the drug; the range of dose was from 60 to 120 milligrammes. The action of the two drugs differed in that "Tubarine" appeared to have a more depressant effect on respiration than "Flaxedil", which acted more quickly and for a shorter total period than "Tubarine". The indications for the modification of electroconvulsive therapy by these drugs were given as poor physical condition with or without senility, pulmonary tuberculosis, and joint and bone diseases, including fractures.

Dr. Scanlan then demonstrated the technique with "Flaxedil" on a male patient, aged seventy-two years, who suffered from depressive attacks. The indication for the use of the relaxing agent in his case was a history of coronary occlusion nine months before. Eighty milligrammes of "Flaxedil" were administered intravenously, and treatment was given when the patient exhibited bilateral ptosis and was unable to lift his head from the pillow when requested. After the shock, administration of pure oxygen by a face mask was commenced and continued until the partially depressed respiratory muscles recovered sufficiently to provide satisfactory breathing.

Organic Reaction Types.

DR. E. T. HILLIARD discussed a case of Alzheimer's disease. He told the story of a female patient whose mother had died of apoplexy at the age of seventy-two years and whose father had died of pneumonia at the age of sixty years. The patient was the eldest of six children. She was well educated and did secretarial work prior to her marriage to a dentist. She then lived for twenty years in a country town, took an active part in social life, and played golf and bridge well. One son was killed in war in 1942. Her present illness had commenced ten years before, when she was noticed to be repeating herself. She complained of frontal headache at times. After two months she began to ramble in her speech. Six months later she became clumsy in her movements and pulled a jug of boiling water over herself. After a short period in hospital for burns it was noticed that her memory was failing. She became careless of her dress and lost interest in her home. On one occasion, when she had visited a friend, she forgot the way home and was lost all night. She then came under care, seven years before, when it was noticed that she had forgotten her age and her social condition. She was dull and without any interest in her environment. She was totally disorientated and was unable to read or write. She was in a filthy and neglected condition. Physically, there was no sign of paresis, slurring speech, nystagmus or ocular changes. Her knee jerks were much exaggerated, the plantar reflex was flexor. Wassermann tests on the blood and cerebro-spinal fluid yielded negative results. She was restless at night and steadily became more confused and lacking in attention to her personal habits. Within twelve months she ceased to speak at all and wandered around restlessly day and night. Twelve months later, after an epileptiform seizure, she took to bed and remained there until her death four years later. She gradually developed a contracted flexed attitude, with absent knee jerks and emaciation. She had occasional epileptiform seizures.

Dr. Hilliard then pointed out that two types of presenile psychosis were currently recognized, namely, Alzheimer's disease and Pick's disease. The two conditions commenced at the same time of life, ran an almost identical course and displayed similar clinical symptoms. However, the following slight points of difference existed. In Alzheimer's disease, no hereditary factor was apparent, memory disturbance occurred early, epileptiform seizures were common, and motor restlessness occurred early. In Pick's disease, there was frequently a family history of the disease, memory disturbance occurred late, epileptiform seizures were rare, and inertia and "peace of mind" were present.

Pathologically the conditions were two separate clinical entities.

Dr. Hilliard's second topic was Huntington's chorea, which, he said, was included to remind them that it was Alzheimer who first demonstrated (in 1911) extensive changes in the *corpus striatum* which he believed were responsible for the motor phenomenon. The nerve cells in the putamen, especially in the middle and posterior parts, were enormously decreased, and there were profound pigmentary change, increase of neuroglia and diminution of size of the cerebral hemispheres. Dr. Hilliard referred to the following points about the condition: it was due to a simple Mendelian dominant—one could expect 30% of affected offspring; cases without demonstrable inheritance were rare; mental changes might precede physical, in other words, the chorea might develop after certification of the patient; early deterioration of behaviour (untidy hoarding, carelessness) occurred, with depression, poverty of thought, and defective memory and judgement, and delusions of persecution or jealousy absurd

in their content were frequent. Physical features were continuous movements of head, trunk and limbs, sometimes more athetoid than choreic, incoordinate voluntary movements, hesitant and stumbling speech, irregular writing, impaired swallowing, increased tendon reflexes but intact sphincters, and termination in dementia and physical helplessness.

A MEETING of the New South Wales Branch of the British Medical Association was held at the Royal Prince Alfred Hospital on May 18, 1950. The meeting took the form of a series of clinical demonstrations by members of the honorary medical and surgical staffs of the hospital.

Endothelioma of the Pleura.

DR. W. COTTER B. HARVEY showed the autopsy specimen of the lungs of a woman, aged forty-six years, who had had vague chest symptoms for some two years, but had presented herself for advice on account of pain in the chest followed by shortness of breath. She was found to have a left-sided pleural effusion, which was aspirated several times with the removal of orange-coloured fluid, sterile on culture. At the site of one of the punctures, there appeared a small nodule which was removed and examined. The pathologist reported this to be a malignant metastasis, possibly from an endothelioma of the pleura. The patient then had a series of thromboses, with œdema spreading from thighs to abdominal wall. She died suddenly six weeks after admission to hospital. *Post mortem* the left pleural cavity was found to be extensively involved in growth, apparently pleural in origin, as no primary lesion was found elsewhere. The pathologist, Dr. V. J. McGovern, had made a final diagnosis of endothelioma of the pleura.

Bronchial Carcinoma.

Dr. Harvey's second case was that of a man, aged sixty-two years, who had had an attack of pneumonia in September, 1948. He apparently recovered, but cough persisted. In July, 1949, an X-ray picture was taken, which showed infiltration of the upper lobe of the left lung. He was diagnosed as having pulmonary tuberculosis and sent to a sanatorium. Though his condition improved there, no tubercle bacilli could be found in his sputum, and he was submitted to bronchoscopy. This showed a mass in his left upper-lobe bronchus, from which a biopsy was taken, revealing a carcinoma of squamous-cell type. The condition was considered inoperable, and in February, 1950, a course of nitrogen mustard injections was begun. On February 9 three milligrammes were given, followed by five milligrammes on the next three days. He tolerated these well, and also further injections of five milligrammes on March 16 and April 18. At this time a further bronchoscopy showed the left upper-lobe bronchus to be almost completely obstructed by a tumour about half an inch below the carina. He was now undergoing a course of deep X-ray therapy. Dr. Harvey drew attention to the X-ray films of his chest, which showed a large cavity in the upper lobe of the left lung and fibrosis at the apex of the right lung, thus simulating pulmonary tuberculosis quite closely. The cavity had altered little in size in the past six months. However, tubercle bacilli could not be found in the patient's sputum. Dr. Harvey also pointed out that this was a slow-growing carcinoma, and that the patient had already survived for a time considerably above the average for such growths. On that account, it was difficult to decide how far the treatment was helping him.

Addison's Disease.

DR. K. S. HARRISON showed a woman, aged fifty-two years, with Addison's disease. She had originally been admitted to Royal Prince Alfred Hospital in July, 1947, in crisis, with a history of darkening of the skin, weakness, anorexia, and loss of weight for six months, and vomiting for one month. She was found to be dehydrated and pigmented, and her blood pressure was 80 millimetres of mercury, systolic, and 65 millimetres, diastolic. The level of chloride in the plasma was 529 milligrammes *per centum*, expressed as sodium chloride. The level of blood urea was 86 milligrammes *per centum*. X-ray examination of the chest showed scarring at both lung apices, probably due to old tuberculosis. She was treated vigorously with salt, adrenal cortical extract, and desoxycorticosterone acetate ("DOCA"). In November, 1947, a subcutaneous implant of 600 milligrammes of "DOCA" was made. After this therapy the patient's general condition improved greatly, and the systolic blood pressure rose to between 160 and 170 millimetres of mercury during the next six months. The blood pressure then began to fall gradually and symptoms of weakness and anorexia returned, so that in March, 1949, a second implantation of 300 milligrammes of "DOCA" was made. The effect of this implant was again very satisfactory and continued for a further period of twelve months. It was found that a third dose of 300 milligrammes of "DOCA" was necessary in March, 1950. Dr. Harrison said that the patient had shown an admirable response, as estimated by a sense of well-being and rise in blood pressure, to quite moderate implants of "DOCA". She had experienced no hypoglycæmic symptoms.

Dr. Harrison's second patient, a man, aged fifty years, with Addison's disease, had been originally admitted to the Royal Prince Alfred Hospital in June, 1948, with a history of lassitude and weakness for three years, pigmentation of the skin, abdominal pain, vomiting and loss of weight for four months. He showed distinct pigmentation of the skin, especially at the site of a recent operation scar. The blood pressure was 125 millimetres of mercury, systolic, and 80 millimetres, diastolic. The level of plasma chloride was 525 milligrammes *per centum*; the blood urea content was 52 milligrammes *per centum* and the Kepler-Power water diuresis test gave a factor of 5. Prior to admission to the hospital he had been treated in another hospital for an Addisonian crisis. In August, 1948, an implantation of 400 milligrammes of "DOCA" was made with excellent clinical benefit. This lasted till June, 1949, when it was found necessary to implant another 300 milligrammes of "DOCA". For a brief period after the first implantation the systolic blood pressure rose to approximately 180 millimetres of mercury and a little œdema of the feet was noted. This hypertensive response was treated by salt restriction with prompt benefit. A careful watch was kept for signs of actual congestive failure, such as venous engorgement or basal râles, which might have necessitated the administration of digitalis or mercurial diuretics, or even removal of the "DOCA".

Exophthalmic Ophthalmoplegia.

Dr. Harrison then presented a man, aged forty-eight years, with exophthalmic ophthalmoplegia. Symptoms of nervousness, fatigue, palpitations, shortness of breath and loss of weight had commenced early in 1949. Prominence of the eyes was noted several months later. Treatment with methyl thiouracil was commenced in August, 1949, and was followed by rapid increase in proptosis, with diplopia and œdema of the conjunctivæ. The basal metabolic rate was originally *plus* 13%, and the highest reading obtained had been *plus* 31%. At present he had prominent eyes with chemosis of the conjunctivæ, lid lag, and bilateral palsies of the lateral rectus muscles. The thyreoid gland was not palpable. There was some residual tremor in spite of treatment with methyl thiouracil. Dr. Harrison said that the patient had been considered to have the type of ophthalmoplegia in which proptosis and muscle weakness followed treatment of active thyreotoxicosis. He had been treated with thiouracil, to control the output of the thyreoid hormone from the thyreoid gland, and dried thyreoid extract, one grain daily, to help suppress the thyreotropic hormone secretion from the pituitary gland.

Dr. Harrison's fourth patient, a man, aged forty-eight years, also had exophthalmic ophthalmoplegia. Five years previously the patient's left eye had rapidly become prominent over the course of a few weeks, and about the same time he had noted diplopia on looking upwards and also on looking to the left. Approximately three months previously the lids of the right eye had become swollen, this being followed in a few days by protrusion of the eye. The basal metabolic rate was *minus* 13% and the blood cholesterol level was 200 milligrammes *per centum*. On examination of the patient, exophthalmos was noted, greater in the left than in the right eye, with paresis of both lateral recti and of the left superior rectus. There was œdema of both orbits and conjunctivæ. The thyreoid gland was not palpable. The patient was treated with thyreoid gland extract, one grain daily. His condition had improved a little under treatment, but recession had not yet been very great.

Patient Suitable for Leucotomy.

PROFESSOR W. S. DAWSON, in presenting a patient considered suitable for leucotomy, explained that prefrontal leucotomy in psychoneuroses and psychoses afforded relief by reducing emotional tension through interruption of tracts connecting the medial nucleus of the thalamus and some or all of the prefrontal areas 9, 10, 11 and 12. The patient, a male clerk (on a pension), aged thirty-nine years, had three children, the youngest aged fourteen months. At the age of twenty years he had became obsessed with a sense of

guilt, for which he sought relief by devotion to religious exercises, and experienced phases of considerable depression. He had to take a holiday from his clerical work for several months. At the age of thirty years he married, having continued regularly at his work for the previous nine years and after being accepted for a pensionable position. Soon after his marriage his wife noted that he used to dart up suddenly as if warding off a blow. Some three years later this exhibition occurred so frequently that he entered a clinic where he received some twenty convulsion treatments. Apparently he was not then "persecuted" or hallucinated, but a year or two later he began to complain that he was humiliated by one or two associates in his office. One of these men reminded him of his father, towards whom in retrospect he developed a strong sense of antagonism. Looking back on his childhood, he decided that his father had unfairly favoured his brothers and sisters. Nevertheless he remained at work for some years. At the age of thirty-six years he began to talk openly of persecution, and also complained that people talked about him and that fellow travellers in public vehicles made signs. He received a short course of convulsion therapy, this time without improvement, and he was put on a pension. For the past three years he had done a little canvassing, but his main occupation was the private study of law. He complained that he had three or four people on his mind, people who, he felt, had humiliated him in years gone by. Tension arose within him so that he had to call out and strike at those people, although he knew that they were not present. His wife corroborated that statement, but added that he had never been aggressive to her or to anyone else. In the clinic he had interested himself in handicrafts, but had been observed to gt up and hit out and adopt defensive attitudes, several times during an hour. He said that he had to [illegible] when he thought of his late persecutors. Pneumoencephalography, carried out by Dr. R. A. Money as a routine before leucotomy, revealed no indication of a focal or space-occupying lesion. After electroencephalography, Dr. Rail reported an abnormal record with paroxysmal changes which lent support to a diagnosis of epilepsy. Since that report, made on May 3, 1950, the patient had been given "Dilantin" one and a half grains and phenobarbital half a grain twice daily, without any effect on his symptoms or his behaviour. He was awaiting operation.

Hysterical Tic.

Professor Dawson then presented a single woman, aged sixty-five years, who had lived in the old home up to two and a half years previously. Her parents had died over twenty years before. She had enjoyed excellent health, and her history was clear of nervous instability up to eighteen months before the meeting. Just before that time a favourite nephew had left the district and she began to feel lonely, "the only one of the family left". She began to feel a tension in her neck and jaws, and increasing sensitiveness about her facial contortions had caused her to drop her few remaining associates. She had left the old home for smaller and more convenient accommodation in a flat. About four months before the meeting she had come to Sydney to seek treatment for these spasms. She stated that various medications gave no relief. Investigation of her family history revealed that a cousin on her father's side had had "fits" since the age of eighteen years. The patient did not know of any relatives with spasms, chorea or other abnormal movements. She was admitted to the clinic on May 2 with a view to more intensive measures. Physical examination revealed no significant abnormality beyond the intermittent spasm of the extensor muscles of the neck, clenching of the jaws and contraction of other facial muscles. Articulation was not affected. Her writing was clear and free from evidence of tremor. Mentally she was complacent. She was undergoing a course of daily inhalations of a mixture of 20% carbon dioxide and 80% oxygen, beginning with 15 and increasing up to 40 in the course of 30 or more sessions. Professor Dawson said that the method had been introduced three years previously by L. von Meduna, with the object of inducing "abreaction" and bringing suppressed conflicts into consciousness, and also as a means of direct chemical action on the basal ganglia (pharmacotherapy). It seemed likely, however, that in the present case any therapeutic benefit would be through suggestion.

Thymic Enlargement and Respiratory Tract Obstruction.

DR. S. P. BELLMAINE presented a male infant, aged eight months. He said that when the child was aged five and a half months, his mother, on March 3, 1950, had reported that he had had a little hard, dry cough since birth, with occasional attacks of noisy breathing, but no distress. The right side of the front of his thorax was observed to be the more prominent; there were no other abnormal physical signs. Radiographic examination of the thorax showed a right-sided mass continuous with the upper mediastinal shadow. The shadow was considered to represent a thymic enlargement. The child was given three applications of deep X-ray therapy by Dr. R. A. Gardner with amelioration of symptoms and diminution of the superior mediastinal shadow.

Dr. Bellmaine then presented a male infant, aged two years, who had been under observation since July, 1948, when he was four months of age. The child had skeletal and cardio-vascular abnormalities in addition to his history of respiratory embarrassment. The last-named was presented as due to thymic pressure for the following reasons: (*a*) the prompt and satisfactory relief, by deep X-ray therapy applied to his thymus, of his previously persistent dyspnœa; (*b*) radiographic evidence suggesting thymic enlargement in the antero-posterior direction, with tracheal narrowing; (*c*) absence of other overt cause of respiratory obstruction. Laryngoscopic examination had revealed no abnormality. Endoscopy had not been carried out, and was not at present intended. Dr. Bellmaine said that in retrospect the mother remembered that the child had breathed noisily, when sucking, from birth—as compared with her other infants—but she did not then report it. One week before the baby was first examined he had developed a "bad cold". On first examination he was slightly cyanosed, with stridor, definite dyspnœa, and well marked recession of the lower ribs anteriorly on inspiration. There were scattered râles and expiratory rhonchi in both lungs. No heart murmur was heard. The infant was admitted to hospital and became gravely ill with bronchopneumonia, from which he was saved by oxygen, chemotherapy and antibiotic therapy. Laryngoscopy at that time revealed no abnormality. The dyspnœa was not relieved in any way by adrenaline. Though there was no other evidence to suggest spasmophilia as a cause of the respiratory disorder, the infant was given calcium ostelin injections (each containing 5000 international units of calciferol) daily for two weeks. After surviving the bronchopneumonia, the infant settled down to a condition of chronic persistent mild to moderate dyspnœa. At the age of eight months, again associated with upper respiratory tract infection, an exacerbation of dyspnœa occurred, and the child was again admitted to hospital. The exacerbation settled with oxygen and steam inhalations. At that time, a soft systolic cardiac murmur at all areas was noted. X-ray examination of the thorax now suggested thymic enlargement with tracheal narrowing. The infant was given a course of deep X-ray applications to the thymus. The improvement was dramatic, and commenced within forty-eight hours of the first application. Two weeks after the completion of the therapy, the child was discharged from hospital without dyspnœa. Prior to the discharge, the radiologist (Dr. A. R. Colwell) made the following report: "I think the trachea does look slightly wider than in the previous rays. I think there is no doubt that there is a diminution in the width of the upper mediastinal shadow. In the lateral view I cannot appreciate any change apart from that already mentioned in the trachea." One month later, the child's condition remained satisfactory; there was some bone deformity of the lower part of the thoracic cage left "high and dry" by the previous inspiratory recession.

The child remained well until April, 1949, when he developed another upper respiratory tract infection, and his respirations again became laboured with inspiratory recession. The condition settled with oxygen and steam inhalations. He again remained well until December, 1949, when another bout of upper respiratory tract infection produced further respiratory difficulty with laboured respirations and inspiratory recession. When this exacerbation settled, some mild dyspnœa persisted, and a further course of deep X-ray therapy to the upper part of the mediastinum was given, with relief of the dyspnœa. Again associated with an upper respiratory tract infection, another attack of dyspnœa occurred in April, 1950. The respiration on this occasion resembled asthma, with prolonged expiration and high-pitched rhonchi. It did not respond to repeated injections of adrenaline, but settled once more with oxygen and penicillin therapy.

Discussing the cardio-vascular condition, Dr. Bellmaine said that a soft systolic murmur was noted in December, 1948, but not interpreted. In December, 1949, a "machinery" murmur was noted at the pulmonary area. Dr. Kempson Maddox, after investigation, had made the diagnosis of patent *ductus arteriosus*, and the child would be followed up by the cardiac clinic. Investigation had revealed no evidence of a vascular ring as a cause of tracheal compression.

Skeletal abnormalities present were plagiocephaly (diagonal skull) and bilateral *talipes calcaneo-valgus*.

Dr. Bellmaine said that it was suggested that the thymus acted as a cause of pressure in the child presented because the upper part of his mediastinum was less roomy than usual, by reason of his congenital vascular abnormality. The history of recurrence and exacerbation by upper respiratory tract infection and necessity for repetition of the course of deep X-ray therapy was in accordance with the description in Brennemann's book "Practice of Pediatrics".

Dr. Bellmaine then went on to discuss whether thymic enlargement as a cause of respiratory tract infection in infants was an entity or not. The following facts were against the idea: (i) Considerable enlargements of the thymus might be confirmed, where there had been no evidence of pressure. (ii) Many authorities had denied that it was possible for even a greatly enlarged thymus, relatively soft organ that it was, to cause compression of a stiff cartilaginous trachea; it was stated that it took a weight of 1000 grammes to close the trachea of a child. (iii) It was held by some that any swelling of the thymus would follow the path of least resistance, and that expansion would take place laterally rather than in the antero-posterior direction, in which tracheal compression would be brought about. (iv) Cases alleged to be thymic in origin had been shown to be due to other causes, such as congenital abnormalities of the larynx, a web-like subglottic ridge, and other abnormalities. The following facts supported the idea: (i) Symptoms appeared in the first year of life; thereafter the growth of the thymus was not *pari passu* with that of the thorax. (ii) The actual obstruction might take place in the bony and rigid thoracic inlet, where there was relatively little chance for expansion in any direction. (iii) Radiological evidence of tracheal displacement and compression associated with thymic enlargement could at times be found. (iv) Chevalier Jackson and Bowman had investigated 30 infants with chronic stridor, by radiological, laryngoscopic and endoscopic means, and in five of the patients demonstrated pressure of an enlarged thymus gland on the trachea. (v) An apparent cause and effect between radiological treatment of the thymus and the relief of obstructive symptoms had been observed sufficiently often; such improvement was observed before the end of forty-eight hours (the five patients of Jackson and Bowman mentioned were relieved in that fashion).

Dr. Bellmaine considered that it was fair to conclude that it was possible for an enlarged thymus, under certain conditions, to produce dyspnœa and stridor in infants, although it was a relatively uncommon cause of such symptoms, and that X-ray therapy of the thymus gland was warranted for obstructive symptoms in infants in whom no other cause could be found.

(To be continued.)

THE KATHERINE BISHOP HARMAN PRIZE.

THE Council of the British Medical Association is prepared to consider an award of the Katherine Bishop Harman Prize for the encouragement of research into the disorders incident to maternity in the year 1951. The value of the prize is £75. The purpose of the prize, founded in 1926, is the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy and child-bearing. It will be awarded for the best essay submitted in open competition, competitors being left free to select the work they wish to present, provided this falls within the scope of the prize. Any registered medical practitioner in the British Empire is eligible to compete.

Should the Council of the Association decide that no essay submitted is of sufficient merit, the prize will not be awarded in 1951, but will be offered again in the year next following this decision, and in this event the money value of the prize on the occasion in question shall be such proportion of the accumulated income as the Council shall determine. The decision of the Council will be final.

Each essay must be typewritten or printed in the English language, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto and enclosing the candidate's name and address. The title of the proposed essay and the motto should be notified in writing to the Secretary by November 1, 1950, and a form for this purpose can be obtained from the Secretary. Essays must be forwarded so as to reach the Secretary, British Medical Association House, Tavistock Square, London, W.C.1, not later than December 31, 1950. Inquiries relative to the prize should be addressed to the Secretary.

PHARMACEUTICAL BENEFITS ACT.

THE following statement is published at the request of the General Secretary of the Federal Council of the British Medical Association in Australia.

Section 11 of the *Pharmaceutical Benefits Act* provides that where there is no approved pharmaceutical chemist in a particular area, the Director-General of Health may approve a medical practitioner practising in that area for the purpose of supplying pharmaceutical benefits, and that benefits supplied by a medical practitioner so approved shall be supplied in accordance with such conditions as are prescribed.

It is clear then that a medical practitioner who practises in an area in which there is no approved pharmaceutical chemist and who does his own dispensing must obtain the approval of the Director-General if he desires payment from the Department of Health for pharmaceutical benefits supplied to patients. No special *pro forma* is required, but in his application to the Director-General the medical practitioner must state (i) his full name and address, (ii) his registration (that is, by Medical Board) number, (iii) the area which his practice covers, and (iv) the location of the nearest chemist.

Although Section 11 does not specifically say so, a medical practitioner, who does his own dispensing and who practises in an area in which there is an approved pharmaceutical chemist, will not be approved for the purpose of supplying pharmaceutical benefits.

Regulation 24 provides that, subject to these regulations (Statutory Rules Number 48, 1950), where a medical practitioner has been approved under Section 11 of the Act, that medical practitioner shall do the acts and things which are required to be done by an approved pharmaceutical chemist in accordance with the Act and these regulations unless the Director-General otherwise directs in respect of any one or more of those Acts and things; and that where a person obtains a pharmaceutical benefit from an approved medical practitioner, that person shall give, and the approved medical practitioner shall obtain, a receipt for the pharmaceutical benefit.

The things and acts which are required to be done by an approved pharmaceutical chemist are set out in "Notes for Approved Chemists" issued by the Department of Health, a copy of which will be forwarded by the department to an approved medical practitioner.

An approved medical practitioner supplying a pharmaceutical benefit to a patient must (i) write a prescription for the particular benefit(s) and (ii) have the prescription endorsed by the patient as having been received.

Medical Societies.

THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA.

A MEETING of the Medical Sciences Club of South Australia was held in the Anatomy Lecture Theatre, Frome Road, Adelaide, on May 5, 1950.

Recent Bacteriological and Viral Work Abroad.

Miss Nancy Atkinson gave a condensed account of her recent visit to America, England and Denmark on study leave. She said that in America she was particularly interested in virus work. Part of the poliomyelitis typing programme was proceeding at the University of Southern California, Los Angeles, and at the Johns Hopkins School of Public Health, Baltimore. In several virus laboratories, including those at the New York State Division of Laboratories and Research, Albany, and at the new isolation unit of the National Institute of Health, Bethesda, she saw the new Coxsackie (C group) viruses affecting suckling mice. At Harvard University, Boston, the poliomyelitis virus was

being grown in tissue cultures of human embryonic brain, a method which might lend itself to typing of the virus. Also some very interesting work was in progress on tracing antigenic materials by the use of fluorescent antibody. In England, at I.C.I. (Pharmaceuticals) Research Laboratories at Blakley and Trafford Park, Manchester, an extensive search was in progress to discover new chemotherapeutic agents for viral and bacterial infections. At the Sir William Dunn School of Pathology at Oxford various new antibiotics were in different stages of investigation. In Canada, at the Connaught Laboratories, Toronto, careful and painstaking work was proceeding on tissue culture, especially of cancer tissue. A very well-equipped virus laboratory had been established at the farm attached to the Connaught Laboratories. Many other laboratories were visited during this trip, including the Hooper Foundation, San Francisco, the Hopkins Marine Biology Station, Pacific Grove, the California Institute of Technology, Pasadena, the Communicable Diseases Centre, Atlanta, and a number of research institutes and university departments in Washington, Philadelphia, New York, New Brunswick, Ithaca, New Orleans, Boston, Ann Arbor and Lansing. The whole trip was made by air and involved only about ten days' travelling time.

Correspondence.

THE USE OF "SODIUM PENTOTHAL" ADMINISTERED CONTINUOUSLY IN ABDOMINAL SURGERY.

SIR: In his reply to criticism Dr. Fowles states: "Please permit me to be confused" (THE MEDICAL JOURNAL OF AUSTRALIA, August 12, 1950). We are obliged to allow him this privilege, but let there not be confusion in the minds of others upon this subject. Anæsthesia for abdominal surgery is required to relax a patient, not in his mind or as to his worries or fears, but as to his musculature, so that there is no reflex tonus and can be no reflex movement. "Pentothal" is inadequate for this requirement. If it is "pushed", anæsthetists and pharmacologists agree that it becomes dangerous. Dr. Fowles does not subject his patients to risk; therefore I put it to him that the relaxation he claims is not complete, but exaggerated in his own mind.

In this, the second half of this scientific century, the methods and the skill of anæsthetists—yes, and of Dr. Fowles himself—are worthy of great praise. Anæsthesiology has become a science. But in the world of technical knowledge and endeavour there is no place for the hyperbole of poets. The wish was ever father to the thought; but let the thought be mothered by good learning and nurtured on the closest scrutiny.

In case some are impressed by Dr. Fowles's point—made rather whimsically—that I should not criticize his method and at the same time admit a limited experience of it, I would point out that one need not be a cook to appreciate an omelette; nor need one wreck his digestion by the consumption of thousands, when it is clear that the seasoning is over-lavish and the substance rather sparse.

Yours, etc.,

KEN MOWAT, M.S.

Brisbane,
August 22, 1950.

NATIONAL HEALTH AND THE PHARMACEUTICAL BENEFITS ACT.

SIR: The implementation of the *Pharmaceutical Benefits* Act regarding a limited free list of life-saving drugs on September 4, 1950, should not be allowed to pass without a word of credit and encouragement to the Federal Minister of Health, Sir Earle Page.

His approach to the problem, by securing the cooperation of interested bodies before rushing in with a cut-and-dried scheme, is in marked contrast to previous attempts to deal with the situation.

As a medical practitioner I wish Sir Earle Page good luck with his attempts to cope with a difficult situation, and assure him of support as far as it is possible to assist him, bearing in mind that much of the machinery of administration is of necessity in lay hands, and cannot be considered a medical field.

Yours, etc.,

H. T. ILLINGWORTH.

17 Boulder Road,
Kalgoorlie,
Western Australia.
August 18, 1950.

DIETARY OXALATES AND EXPERIMENTAL DENTAL CARIES.

SIR: The relationships between dietary oxalates and dental caries are of considerable interest to nutritionists and students of preventive dentistry. It is commonly believed that one factor in the production of dental caries is the action on the tooth enamel of the lactic acid produced in the mouth as a result of bacterial fermentation of carbohydrate foods. In 1946, Gortner, McCay, Restarski and Schlack demonstrated that the presence of soluble oxalates in the food or drinking water of the rat effectively protected the molars of this animal from the decalcifying action of ingested phosphoric and citric acids. Oxalate-containing vegetables, such as spinach and rhubarb, incorporated in the diet gave a similar protection.

Recently Twedt and Cajori (1950), following up the previous work of Gortner *et alii*, thought it would be of interest to determine whether soluble dietary oxalate could reduce the incidence of caries in the Syrian hamster subsisting on a high-sugar diet, which is known to induce a high caries incidence in these animals. The hamsters' teeth are similar to human teeth in that they are covered with enamel.

All groups of animals received the caries producing diet, but the experimental group received in addition sodium oxalate at the level of 0·5%. After one hundred and twenty-five days on the diets it was evident that the group supplemented with sodium oxalate had an appreciably lower caries incidence than the control group. Chemical analysis of the teeth showed that considerably more oxalic acid could be detected in the tooth substance of the oxalate-supplemented groups.

Some human foodstuffs contain appreciable quantities of oxalate, and in view of the above experimental findings it is possible that oxalate may play a significant role in caries resistance in the human species. For instance, the incidence of dental caries amongst New Guinea natives is known to be low. Diets of these natives regularly contain appreciable quantities of green leaves, most of which contain oxalic acid. In a dietary survey carried out at Patep (a mountain village in New Guinea) in 1947, Langley (New Guinea Nutrition Survey, 1947) found that green leaves formed 5·3% by weight of the diet.

The oxalic acid equivalent contained in a number of these leaves commonly used in New Guinea diets was determined by Hodges *et alii* (New Guinea Nutrition Survey, 1947) and the values obtained ranged from 0·18% to 0·99%. The leaves of *Hibiscus abelmoschus* (pidgin English—aibika), which is probably the most commonly used type of native spinach, contained the equivalent of 990 milligrammes of oxalic acid in 100 grammes of food (that is, 0·99%). It can be calculated from these data that the concentration of oxalate in the diet of these natives would have been of the order of magnitude of 0·05%.

Larsen (1948) attributed the comparative freedom from tooth decay of the native Hawaiians partly to their consumption of large quantities of taro, which is high in oxalates.

Twedt and Cajori (1950) remark that the minimum concentration of ingested oxalate in the diet that is necessary to afford protection (in the hamster) has not been determined. They state further that until it has been shown that the oxalate ion in low concentrations is an inhibitor of acidogenic organisms, its protective action against carious lesions must be regarded as being localized in the enamel or on the tooth surface.

The possibility that dietary oxalate may be related to caries resistance in humans, raises the question as to the place spinach, rhubarb and other oxalate-containing vegetables should occupy in the usual Australian diet. It has been claimed by some that because of the apparent calcium-binding effect of oxalate, spinach and rhubarb should not occur prominently in the diets of children. There is no evidence, however, that the inclusion of such vegetables

in a good diet has ever adversely affected the calcium balance of adults or children. Because of its richness in vitamin *A*, vitamin *E*, iron and other nutritive elements, spinach may well retain its customary place along with other leafy vegetables in the diet of children and adults. In addition, the possibility must be considered that it may play a significant role in caries prevention.

Yours, etc.,

EBEN H. HIPSLEY,
Nutrition Services, Commonwealth Department of Health.
Australian Institute of Anatomy,
Canberra,
August 15, 1950.

References.

Gortner, R. A., McCay, C. M., Restarski, J. S., and Schlack, C. A. (1946), "Some Effects of Dietary Oxalate on the Teeth of White Rats", *Journal of Nutrition*, Volume XXXII, page 121.

Larsen, N. P. (1948), "Tooth Decay in Relation to Diet and General Health", *The Journal of the American Medical Association*, Volume CXXXVII, page 832.

Twedt, R. M., and Cajori, F. A. (1950), "The Prevention of Caries in the Syrian Hamster with Sodium Oxalate", *Journal of Nutrition*, Volume XL, page 393.

Post-Graduate Work.

THE AUSTRALIAN POST-GRADUATE FEDERATION IN MEDICINE.

Post-Graduate Opportunities in the United States of America.

THE Australian Post-Graduate Federation in Medicine announces the following opportunities for post-graduate work and training in the United States of America for which Australian graduates are eligible to apply. These opportunities, which include interne, resident and other training, will be available at the following hospitals: (i) Saint Luke's Hospital, Kansas City, Missouri—two rotating internships; (ii) Saint Joseph's Hospital, Syracuse, New York—one rotating internship.

Further inquiries concerning these positions should be made by post-graduates to the post-graduate committee of the State in which they reside.

Additional announcements of other institutions will be made from time to time.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Week-End Course in Rheumatic Diseases.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that a week-end course in rheumatic diseases suitable for general practitioners will be conducted in Sydney on Saturday and Sunday, October 14 and 15, 1950. All lectures and demonstrations will be held at the Royal Prince Alfred Hospital, Camperdown, the programme being as follows.

Saturday, October 14.—9.45 a.m., "Classification of Rheumatic Diseases and Their Differential Diagnosis", Dr. A. J. Collins; 10.30 a.m. to 12.30 p.m., clinical demonstration, Dr. Selwyn G. Nelson; 2 p.m. to 3.45 p.m., "Pathology, Biochemistry and Radiology of Rheumatic Diseases", Dr. V. J. McGovern, Dr. E. M. A. Day and Dr. Mary Cronin; 4 p.m., "Gout", Dr. A. W. Morrow.

Sunday, October 15.—9.45 a.m., "Ankylosing Spondylitis", Dr. S. A. Smith; 10.15 a.m., "Principles of Management of Arthritic Diseases", Dr. A. J. Collins; 11.15 a.m., panel discussion on "Treatment", Dr. B. G. Wade, Dr. L. J. Woodland and Dr. Selwyn G. Nelson.

The fee for attendance is £2 2s., and the closing date for receipt of applications is October 6, 1950. Those wishing to enrol are requested to forward their remittance to the Course Secretary, the Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney, as soon as possible. Telephones: BU 5238, BW 7483. Telegraphic address: Postgrad, Sydney.

Examinations for Higher Degrees and Diplomas.

The Post-Graduate Committee in Medicine in the University of Sydney announces that the following candidates have passed in the examinations for the degree and diplomas mentioned:

Master of Surgery, Part I.—R. B. Wiles.

Master of Surgery, Part II.—J. A. Bond, D. H. Cohen, J. F. M. Furber, J. M. F. Grant, V. S. Howarth, W. L. H. Keller, A. W. J. Watts.

Diploma in Anæsthesia.—C. A. Sara.

Diploma in Dermatological Medicine, Part I.—F. Bauer, D. M. Clarke, B. H. R. Hill, R. A. Langley.

Diploma in Dermatological Medicine, Part II.—F. Bauer, D. M. Clarke, B. H. R. Hill, R. A. Langley.

Diploma in Gynæcology and Obstetrics, Part I.—R. B. Kendall, L. H. McMahon.

Diploma in Gynæcology and Obstetrics, Part II.—Lois E. Benson, L. H. McMahon, Helen E. Thomson.

Diploma in Laryngology and Otorhinology, Part I.—Platon Black, F. F. Ellis.

Diploma in Laryngology and Otorhinology, Part II.—F. F. Ellis.

Diploma in Ophthalmology, Part I.—D. C. C. Hinder, J. W. Hornbrook, K. C. MacMillan, D. L. Rich, C. J. Walter, B. G. Wilson.

Diploma in Ophthalmology, Part II.—C. H. Baker, K. C. MacMillan.

Diploma in Clinical Pathology.—Leonard Carter (biochemistry), Sheila M. C. Drescher (pathological anatomy and hæmatology), L. R. Finlay-Jones (pathological anatomy and hæmatology), Alison K. Garven (bacteriology and parasitology), E. Hirst (now completed diploma with bacteriology and parasitology and biochemistry), T. D. Orban (now completed diploma with bacteriology and parasitology and pathological anatomy and hæmatology), A. K. Sewell (biochemistry).

Diploma in Psychological Medicine, Part I.—D. N. Everingham, H. P. Greenberg, Carl Radeski, F. J. Scanlan, J. K. Wilson.

Diploma in Psychological Medicine, Part II.—D. S. Brandt, A. T. Clements, D. R. Morgan.

Diploma in Diagnostic Radiology, Part I.—T. W. Anderson, J. F. Laycock, D. W. Urquhart, J. M. Wilshire.

Diploma in Diagnostic Radiology, Part II.—T. W. Anderson, P. S. Larbalestier, J. F. Laycock, J. McKell, D. W. Urquhart.

Diploma in Therapeutic Radiology, Part I.—D. W. Urquhart.

Diploma in Therapeutic Radiology, Part II.—J. C. Binns, D. W. Urquhart.

THE MELBOURNE PERMANENT POST-GRADUATE COMMITTEE.

PROGRAMME FOR OCTOBER.

Week-End Course at Horsham Base Hospital.

A WEEK-END COURSE will be held at Horsham Base Hospital on October 7 and 8, 1950. The programme is as follows.

Saturday.—3 p.m., Dr. H. B. Kay, "Cardiac Problems"; 8 p.m., Dr. D. F. Lawson, "Obstetrical Emergencies following Delivery".

Sunday.—10 a.m., Dr. Russell Howard, "The Acute Abdominal Emergency with Special Reference to the Difficult Appendix".

The fee for this course is £1 11s. 6d., or 10s. 6d. per demonstration, and enrolments should be made with Dr. A. L. Bridge, Horsham, telephone 577.

Obituary.

WILLIAM HENRY FITCHETT.

WE are indebted to Dr. Carl Wood for the following appreciation of Dr. William Henry Fitchett.

We much regretted to read of the death of Dr. William Henry Fitchett, who died on April 21, 1950.

Owing to illness, William Henry Fitchett only started his medical course at the age of thirty-four, and utilized his time of waiting by wide reading and the making of many contacts, both of which well prepared him for his successful career as a journalist in his later years.

After a brilliant medical course, during which he won the Physiology Exhibition, and a residency at the Melbourne Hospital, Dr. Fitchett practised at New Norfolk, Tasmania, and there consolidated his restoration to health. He then finally settled in Elsternwick, obtained his Diploma of Public Health, and specialized in radiology. For twenty-five years he was health officer for Caulfield Municipality and there won the respect of the municipal officers, who greatly mourned his death.

Dr. Fitchett published three journals, *The General Practitioner*, *Medical Topics* and *Physician's Index*. In so doing his great aim was to help the general practitioner to read easily subjects which vitally interested him. How great was his success is not known to all. The journals were circulated in almost every country in the world, and for a time, even in Russia. Nurtured in journalism, under the tutelage of his father, the late Reverend W. H. Fitchett, Dr. Fitchett was well equipped for his task, and, for a medical man, his achievement was unique.

A man of forceful character, great courage and convictions, Dr. Fitchett carried out his two favourite maxims, "The best I can for the best I know", and "Without fear or favour". To those who knew him well he was loved and respected for his hospitality and capacity for attracting great personalities to his home. With his brilliant wife, who was his partner and comforter in his long period of illness, he entertained in a way that will long be remembered. A gathering at Orrong Road was a highlight for all privileged to be there. A lover of the arts, and, with Mrs. Fitchett, the befriender of many, Dr. W. H. Fitchett will long remain in our memory. His extensive library has been bequeathed to the British Medical Association.

JAMES BROWN.

We regret to announce the death of Dr. James Brown, which occurred on August 17, 1950, at Toowoomba, Queensland.

Naval, Military and Air Force.

APPOINTMENTS.

The following appointments, promotions *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 49, of August 24, 1950.

AUSTRALIAN MILITARY FORCES.

Royal Australian Army Medical Corps (Medical).

N73138 Colonel A. M. McIntosh is transferred to the Citizen Military Forces, 1st June, 1950.

Citizen Military Forces.

Eastern Command: Second Military District.

Royal Australian Army Medical Corps (Medical).—2/50474 Colonel A. M. McIntosh is transferred from the Interim Army and appointed Deputy Director of Medical Services, Headquarters, Eastern Command, 1st June, 1950. To be Captain (provisionally), 5th July, 1950: 2/127017 William Cleaver Woods.

Southern Command: Third Military District.

Royal Australian Army Medical Corps (Medical).—3/101811 Major T. K. Durbridge is appointed from the Reserve of Officers, 11th May, 1950.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED AUGUST 19, 1950.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.[2]	Australian Capital Territory.	Australia.[3]
Ankylostomiasis	*	..	..	..	..	..	..	..	..
Anthrax	*	*	*	*	*	*	..	*	..
Beriberi	*	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Cerebro-spinal Meningitis	4(3)	3(1)	2	1(1)	..	..	..	..	10
Cholera	..	..	..	..	..	..	..	..	..
Coastal Fever(*a*)	*	*	..	*	*	*	*	*	..
Dengue	*	*	*	*	*	*	..	*	..
Diarrhœa (Infantile)	..	..	1(1)	..	..	..	..	..	1
Diphtheria	2(1)	1	5(2)	3(1)	6(2)	2(2)	..	..	19
Dysentery (Amœbic)	*	..	..	..	..	..	..	..	..
Dysentery (Bacillary)	*	..	..	..	..	..	..	..	..
Encephalitis Lethargica	..	..	..	..	..	..	..	..	..
Erysipelas	*	*	*	..	*	*	..	..	..
Filariasis	*	..	..	..	..	..	..	..	..
Helminthiasis	*	..	*	*	*	*	*	*	..
Hydatid	*	..	*	*	..	*	*	..	..
Influenza	*	*	*	..	*	*	..	*	..
Lead Poisoning	*	*	..	*	*	*	*	*	..
Leprosy	..	..	..	..	..	..	..	..	..
Malaria(*b*)	*	..	..	..	..	..	..	..	..
Measles	*	*	*	210(150)	*	*	..	4	214
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	4(3)	1	1	11(9)	1(1)	1	..	1	20
Psittacosis	*	..	*	..	..	*	*	*	..
Puerperal Fever	..	..	1	1(1)	..	..	..	..	2
Rubella(*c*)	*	*	..	*	1(1)	*	..	..	1
Scarlet Fever	21(15)	15(8)	7(5)	7(7)	4(4)	6	..	..	60
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	*	..	..	*	*	*	*	*	..
Trachoma	*	..	*	*	*	*	*	*	..
Tuberculosis(*d*)	35(30)	18(10)	14(3)	15(10)	11(5)	6(3)	..	1	100
Typhoid Fever(*e*)	..	..	..	..	..	1(1)	..	..	1
Typhus (Endemic)(*f*)	..	..	..	..	..	..	..	..	..
Undulant Fever	1(1)	..	..	..	..	..	..	..	1
Weil's Disease(*g*)	*	*	..	*	*	*	*	*	..
Whooping Cough	*	*	*	4(2)	*	*	..	..	4
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] The form of this table is taken from the *Official Year Book of the Commonwealth of Australia*, Number 37, 1946–1947. Figures in parentheses are those for the metropolitan area.
[2] Figures not available.
[3] Figures incomplete owing to absence of returns from the Northern Territory.
* Not notifiable.
(*a*) Includes Mossman and Sarina fevers. (*b*) Mainly relapses among servicemen infected overseas. (*c*) Notifiable disease in Queensland in females aged over fourteen years. (*d*) Includes all forms. (*e*) Includes enteric fever, paratyphoid fevers and other Salmonella infections. (*f*) Includes scrub, murine and tick typhus. (*g*) Includes leptospiroses, Weil' and para-Weil's disease.

ROYAL AUSTRALIAN AIR FORCE.

Permanent Air Force.

Medical Branch.

The probationary appointment of Flight Lieutenant W. L. Rait (257764) is confirmed.

Doctor Laurance Arthur Watson, M.B., B.S. (257779), is appointed to a short service commission, on probation, for a period of twelve months, 21st October, 1949, with the rank of Flight Lieutenant.

The resignation of Flight Lieutenant (Temporary Squadron Leader) R. G. Skinner (257526) is accepted, 10th March, 1950.

Active Citizen Air Force.

Medical Branch.

Flight Lieutenant R. R. Collman (450366) is appointed from the Reserve, 3rd July, 1950.

Citizen Air Force Reserve.

Medical Branch.

Clement Henry Walsh (267801) is appointed to a commission with the temporary rank of Squadron Leader, 9th November, 1949.

Australian Medical Board Proceedings.

QUEENSLAND.

THE undermentioned have been registered, pursuant to the provisions of *The Medical Acts, 1939 to 1948*, of Queensland, as duly qualified medical practitioners:

Grant, Peter John Falconar, M.B., B.S., 1945 (Univ. Sydney), 68 Oriel Road, Clayfield, Brisbane.

Hudson, Kingsley Dixon, M.B., Ch.M., 1923 (Univ. Sydney), Condamine Street, Dalby.

TASMANIA.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Act*, 1918, of Tasmania, as duly qualified medical practitioners:

Mitchell, Paul Wanostrocht, M.B., B.S., 1948 (Univ. Queensland), Royal Hobart Hospital, Hobart.

McArthur, Andrew McShee, M.B., Ch.B., 1934 (Glasgow).

The following additional qualification has been registered:

Hull, Eric Douglas, F.R.A.C.S., 1950.

Notice.

A MEETING will be held in the Robert H. Todd Assembly Hall, British Medical Association House, 135 Macquarie Street, Sydney, on Wednesday, October 11, 1950, at 8 p.m. The subject will be "Pulmonary Œdema as a Complication of Major Surgery". The speakers will be Dr. J. H. Tyrer, who will present the physiological aspect, Dr. A. W. Morrow, who will present the medical aspect, Dr. Norman Wyndham, who will present the surgical aspect, and Dr. W. I. T. Hotten, who will present the point of view of the anæsthetist. The chairman will be Dr. M. P. Susman. The meeting has been arranged by the medical officers of the Repatriation Hospital, Concord.

Medical Appointments.

Dr. R. K. Stevenson has been appointed public vaccinator, Heywood, Victoria.

Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Fromer, Joseph, registered in accordance with the provisions of Section 17 (1) (c) of the *Medical Practitioners Act*, 1938-1945, Hospital for New Australians, Greta, New South Wales.

Diary for the Month.

SEPT. 12.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

SEPT. 18.—Victorian Branch, B.M.A.: Finance, House and Library Subcommittee.

SEPT. 19.—New South Wales Branch, B.M.A.: Medical Politics Committee.

SEPT. 20.—Western Australian Branch, B.M.A.: General Meeting.

SEPT. 21.—New South Wales Branch, B.M.A.: Clinical Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney)—All contract practice appointments in New South Wales.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federal Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178 North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

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